NOVEMBER 29, 1947

THE LANCET

Offices: 7, ADAM STREET, ADELPHI, W.C.2

Telegrams: LANCET, RAND, LONDON **Telephone:** TEMPLE BAR 7228 and 7229

No. XXII OF VOL. II, 1947 LONDON, SATURDAY, NOVEMBER 29, 1947 Pp. 72—Price 1s.
No. 6483 VOL. CCLIII Founded 1823 PUBLISHED WEEKLY Registered as a Newspaper Annual Subscription: Inland £2 2s. Abroad £2 10s.

LIVOGEN

Trade Mark

The Rational Tonic

A highly active preparation for use in those cases of lassitude and debility attributable to dietary deficiencies and physical and mental stress. Livogen is readily taken even by children and fastidious invalids.

Particulars of dosage on request

THE BRITISH DRUG HOUSES LTD. LONDON N.1

THE LIBRARY OF CONGRESS SERIAL RECORD

DEC 18 1947

Copy

OXFORD MEDICAL PUBLICATIONS

SEE PAGE 2

TECHNIQUE OF GASTRIC OPERATIONS

By RODNEY MAINGOT, F.R.C.S.
Surgeon, Royal Free Hospital

Pp 252 117 Illustrations on 54 Plates 15s. net

"A valuable addition to any surgeon's library."
POST-GRADUATE MEDICAL JOURNAL

Oxford University Press London, E.C.4

CONTROL OF COMMON FEVERS

By twenty-one Contributors. Arranged by Dr. ROBERT CRUICKSHANK and EDITOR OF THE LANCET
Demy 8vo 362 + vi pages 33 graphs 38 Tables 12s. 6d. + 5d. postage

The Lancet Limited, 7, Adam-street, Adelphi, London, W.C.2

Second Edition Now available

SURGERY: A TEXTBOOK FOR STUDENTS

By CHARLES AUBREY PANNETT, B.Sc., M.D., F.R.C.S.
Professor of Surgery, University of London; Director of the Surgical Unit, St. Mary's Hospital, London; sometime member of the Court of Examiners R.C.S. Eng., and Examiner to the Universities of London, Manchester, and Cardiff

769 + xiv Price 27s. 6d. net, plus postage
Extensively illustrated throughout text

The book has been completely revised to incorporate advances in surgery since the issue of the first edition. At the same time unnecessary matter has been avoided, so that the book remains a presentation of modern surgery of moderate size. The character of the book has been preserved but the additional matter makes it more generally useful to postgraduate as well as undergraduate students

Hodder & Stoughton Ltd., 20, Warwick-square, London, E.C.4

Second Edition, revised and enlarged

GUIDE FOR THE TUBERCULOUS PATIENT

By G. S. ERWIN, M.D.
Medical Superintendent, Liverpool Sanatorium, Frodsham

"Gives the reader a sense of uncomplicated counsel such as the physician would offer in person . . . will save his time and advance the patient's understanding . . . a contribution to morale, and therefore to treatment."—*British Medical Journal.*

128 pages 3s 6d net

Wm. Heinemann • Medical Books • Ltd. London

54 Illustrations Demy 8vo 12s. 6d. net; postage 4d.

VARICOSE VEINS, HÆMORRHOIDS

By R. ROWDEN FOOTE

". . . . the best account so far published on the subject."
—*Journal of the Royal Naval Medical Service*

London: H. K. Lewis & Co. Ltd., 136 Gower-street, W.C.1

THE CARE OF TUBERCULOSIS IN THE HOME

By JAMES MAXWELL, M.D., F.R.C.P.
Assistant Physician and Demonstrator of Practical Medicine, St. Bartholomew's Hospital; Physician, Royal Chest Hospital; Consulting Physician, Royal National Sanatorium, Bournemouth

Demy 8vo 106 + xii Illustrations 7s. 6d. net, plus postage

Hodder & Stoughton, Ltd., 20, Warwick-square, London, E.C.4

RADIOTHERAPY IN THE DISEASES OF WOMEN

By MALCOLM DONALDSON, B.A. (Cantab.), F.R.C.S. (Eng.), M.B., Ch.B. (Cantab.)
Physician Accoucheur with Charge of Out-patients, St. Bartholomew's Hospital; Consulting Gynæcologist, Royal Northern Hospital, &c.

Demy 8vo 148 pages 11 Illustrations in the Text; 2 Plates, one in Colour Price 7s. 6d. net; postage 7d.

Hodder & Stoughton, Ltd., 20, Warwick-square, London, E.C.4

NEW BOOKS FROM ARNOLD

MURIEL BARTON HALL'S

Psychiatric Examination of the School Child

viii + 356 pages, fully illustrated with case histories and diagrams. *Ready January 8.* 15s. net.

JOHN H. EWEN'S

Mental Health

A Practical Guide to Disorders of the Mind. 266 pages, fully illustrated with case histories. *Recently published.* 12s. 6d. net.

HENRY V. DICKS'S

Clinical Studies in Psychopathology

A Contribution to the Ætiology of Neurotic Illness

Second Edition. 232 pages, fully illustrated with case histories. *ust published.* 15s. net.

W. S. C. COPEMAN'S

The Treatment of Rheumatism in General Practice

Fourth Edition. viii + 260 pages. *Just published.* 12s. 6d. net.

W. GORDON SEARS'S

Vade-Mecum of Medical Treatment

Fifth Edition. viii + 405 pages, arranged alphabetically. *Published Nov. 13.* 10s. 6d. net.

STEFAN ENGEL'S

The Child's Lung

viii + 332 pages, 283 illustrations. *Just published.* 40s. net.

EDWARD ARNOLD & CO., 41 MADDOX ST., LONDON, W.1

no visas for vitamins . . .

Shortly before World War I the term " vitamine " made its debut in the medical vocabulary. Twelve years later the first concentrated vitamin preparation appeared in Britain. This was ' Ostelin ' vitamin D, made then—and still made—by Glaxo.

Today the range of Glaxo vitamin preparations is available in almost every country. Indeed, few folk enjoy the same world-wide travel facilities as these Glaxo envoys.

GLAXO LABORATORIES LTD.
GREENFORD, MIDDLESEX

Other factories and laboratories in England at Barnard Castle, Driffield, Stratford E.15 and Ulverston (under construction)
In Argentina, Australia, India, Italy and New Zealand. Agents in almost every country in the world.

ADEXOLIN*—Vitamins A and D
BERIN*—Vitamin B1
CELIN—Vitamin C
HIGH POTENCY OSTELIN—Vitamin D
KAPILON*—Vitamin K analogue
NICORBIN—Vitamins B1, C, Nicotinic Acid
OSTELIN*—Vitamin D
PELONIN—Nicotinic Acid
PELONIN AMIDE—Nicotinamide
PERMIDIN—Vitamin P (hesperidin)
PREPALIN*—Vitamin A
VITEOLIN—Vitamin E
*The name of this preparation changes slightly in certain countries

'MYANESIN'

The new muscle relaxant

NOW AVAILABLE

Clinical trials, involving its use in over a thousand cases, have clearly shown the value of ' Myanesin ' for relaxation of the abdominal musculature during surgical operations.
' Myanesin ' was discovered in the B.D.H. Research Department. It is an entirely synthetic substance of known and constant chemical composition [α:β-dihydroxy-γ-(2-methylphenoxy)-propane].
' Myanesin ' is now available as a 10 per cent. solution in ampoules of 10 ml. issued in boxes of 3 and 12 ampoules.

Details of dosage and other relevant information on request

THE BRITISH DRUG HOUSES LTD. LONDON N.1
Telephone: Clerkenwell 3000 Telegrams: Tetradome Telex London
Myn/E/1a

NOV. 29, 1947

THE LANCET

A JOURNAL OF BRITISH AND FOREIGN MEDICINE, SURGERY, OBSTETRICS, PHYSIOLOGY, PATHOLOGY, PHARMACOLOGY, PUBLIC HEALTH, AND NEWS

No. 6483 LONDON: SATURDAY, NOVEMBER 29, 1947 CCLIII

CONTENTS

THE WHOLE OF THE LITERARY MATTER IN THE LANCET IS COPYRIGHT

ORIGINAL ARTICLES

A Hepatic Syndrome of Wide Distribution
Prof. BRIAN MAEGRAITH, M.B.
W. H. H. ANDREWS, B.M.
DAVID GALL, B.M. 781

Epidemic Myalgia or Bornholm Disease in South India
Major H. J. HAMBURGER, M.D.
Major C. MCNEIL, M.B. 784

Symptoms due to Meckel's Diverticulum
SELWYN TAYLOR, F.R.C.S. .. 786

Determination of Hæmoglobin: II. The Haldane Hæmoglobin Standard
Prof. E. J. KING, D.SC., and others 789

Dissemination of Hæmolytic Streptococci in Air
LEONARD COLEBROOK, F.R.C.O.G., F.R.S.
W. P. D. ROSS, M.B. 792

Calciferol in the Treatment of Chilblains
S. T. ANNING, M.D. 794

SPECIAL ARTICLES

Geriatric Rehabilitation
L. Z. COSIN, F.R.C.S. 804

Dynamics of the Cerebrospinal Fluid 804

General Medical Council 805

London's Voluntary Hospitals... 805

MEDICAL SOCIETIES

British Orthopædic Association: Recurrent Dislocation of the Shoulder 795

REVIEWS OF BOOKS

Radium Dosage: the Manchester System. W. J. Meredith, M.SC. 796

Milk and Food Sanitation Practice. H. S. Adams, B.SC..... 796

Atlas of Cardiovascular Diseases. I. J. Treiger, M.D. 796

IN ENGLAND NOW

A Running Commentary by Peripatetic Correspondents 806

LEADING ARTICLES

AMBULANCES 797

CHOLERA AND HYSTERIA 797

THE ENIGMA OF HÆMOPHILIA... 798

SERVICE MEDICINE 799

ANNOTATIONS

Calciferol for Chilblains..... 800

A Social Research Council ?..... 801

Dicoumarol in Coronary Thrombosis 801

The National Hearing-aid..... 801

Fumigation with Methyl Bromide 802

Television in Surgical Operations 802

Britain's Health 802

That Cold Virus Again..... 803

Meeting the Minister 803

Sir Charles Sherrington—on his 90th Birthday 803

MEDICINE AND THE LAW

Death or Injury "attributable to war service" 812

LETTERS TO THE EDITOR

Penicillin in Cases of Closed Oral Sepsis (Dr. J. W. Hallam).... 807

Tubocurarine in Tetanus (Dr. W. G. Sears) 807

The Health of Authors (Dr. L. D. Malone) 807

Treatment of Boils (Dr. I. Gottlieb) 808

Typhoid Carriers Treated with Penicillin and Sulphathiazole (Dr. C. H. Comerford, Dr. H. Richmond, Dr. W. W. Kay).. 808

Depersonalisation Syndrome (Dr. S. H. Foulkes) 808

Streptomycin in Influenzal Meningitis (Dr. B. Gottlieb)... 809

Hormone Treatment by Implanting Pellets (Dr. S. L. Simpson) 809

Renal Circulation (Dr. J. F. Heggie) 809

Spirillum minus Treatment of G.P.I. (Dr. J. O. Poynton).... 810

The Chronic Paretic (Dr. I. Atkin) 811

Teaching Appointments (Dr. J. G. McCrie, Dr. Halliday Sutherland)..... 811

Flare-up in the Glass House ?... 811

Handkerchiefs Impregnated with Disinfectant (Dr. K. Dumbell, Dr. J. E. Lovelock, Dr. E. J. Lowbury)..... 811

PUBLIC HEALTH

Tuberculosis in Lancashire 811

Poliomyelitis and Polioencephalitis 812

Infectious Disease in England and Wales 812

PARLIAMENT

From the Press Gallery: More about Our Calories 813

Question Time: Source of Our Calories — Rehabilitation Centres in Scotland—Government Grants for Cancer Research—Future of Private Homes—Accommodation for Mental Defectives 813

OBITUARY

William Seaman Bainbridge..... 814

Robert Carmichael Wood..... 814

NOTES AND NEWS

Committee on Certificates Issued by Practitioners 814

Food and Health 814

Homes of St. Giles 814

Keeping the Engine Warm 815

Short Form of Birth Certificate 805

University of Cambridge 815

University of Sheffield 815

Royal College of Surgeons of England 815

Production of Penicillin 815

Specialist Appointments in the L.C.C. Service 815

Appointments 816

Diary of the Week 816

Births, Marriages, and Deaths... 814

Founded 1892 Assets exceed £100,000

The MEDICAL PROTECTION SOCIETY Limited

President: SIR ERNEST ROCK CARLING, F.R.C.P., F.R.C.S., F.F.R.

Established for the protection of the professional interests of medical and dental practitioners. Members receive advice and assistance in all matters affecting the practice of their profession and are afforded COMPLETE INDEMNITY against costs and damages in cases undertaken on their behalf.

Entrance Fee 10/-

Annual Subscription £1 Membership Exceeds 22,000

No entrance fee to those joining within 12 months of registration

An additional subscription will secure indemnity in respect of practice overseas

Full particulars and application form from—

The Secretary, VICTORY HOUSE, LEICESTER SQUARE, W.C.2 GERrard 4553 & 4814

OXFORD MEDICAL PUBLICATIONS

THE PARATHYROID GLANDS AND SKELETON IN RENAL DISEASE

By **J. R. GILMOUR**, M.R.C.P.

Pathologist in Emergency Medical Service; Junior Assistant Director, Bernhard Baron Institute of Pathology, London Hospital

Pp. 172 — 26 Illustrations — **18s.** net

OBSTETRICS AND GYNÆCOLOGY

A Revision Course for Practitioners

By **C. SCOTT RUSSELL**, M.B., F.R.C.S. (Edin.), M.R.C.O.G.

Assistant Director, Department of Obstetrics and Gynæcology, University of Manchester; formerly First Assistant, Nuffield Department of Obstetrics and Gynæcology, University of Oxford

With a Foreword by

J. CHASSAR MOIR, D.M., F.R.C.S. (Edin.), F.R.C.O.G.

Nuffield Professor of Obstetrics and Gynæcology, University of Oxford

Pp. 222 — 21 Illustrations — **12s. 6d.** net

A PRACTICAL TEXTBOOK OF LEPROSY

By **R. G. COCHRANE**, M.D., F.R.C.P. (Lond.), D.T.M. & H. (Eng.)

Medical Secretary, Mission to Lepers; Principal, Missionary Medical College, Vellore, S. India

With a Foreword by **Sir GEORGE McROBERT**, C.I.E., M.D., F.R.C.P., D.T.M. & H., Lt.-Col., I.M.S.

Lately Professor of Medicine, Madras Medical College

Pp. 288 — 174 Illustrations — **42s.** net

DISEASES OF THE NERVOUS SYSTEM

By **W. RUSSELL BRAIN**, D.M., F.R.C.P.

Third Edition — Pp. 1008 — 79 Illustrations — **37s. 6d.** net

SENSORY MECHANISMS OF THE RETINA

By **RAGNAR GRANIT**, M.D.

Pp. 432 — 178 Illustrations — **35s.** net

HEPARIN

By **J. ERIK JORPES**, M.D.

Second Edition — Pp. 260 — 21 Illustrations — **18s.** net

BACTERIA IN RELATION TO DOMESTIC SCIENCE

By **C. E. DUKES**, O.B.E., M.D., M.Sc., D.P.H.

Pp. 246 — 10 Illustrations — **12s. 6d.** net

ELEMENTS OF SURGERY

By **FAUSET WELSH**, M.B., B.Sc., F.R.C.S.

Pp. 88 — **7s. 6d.** net

DISEASES OF THE HEART AND CIRCULATION

By **A. A. FITZGERALD PEEL**, M.A., D.M., F.R.F.P.S.(G.)

Pp. 420 — 113 Illustrations — **35s.** net

Oxford University Press

AMEN HOUSE **WARWICK SQUARE** **LONDON E.C.4**

BOOKS are good presents

RECENT ADVANCES

CLINICAL PATHOLOGY
By various authors. Edited by S. C. DYKE, D.M., F.R.C.P. 34 Plates and 22 Text-figures. 25s.

ENDOCRINOLOGY
By A. T. CAMERON, *C.M.G.*, D.Sc., F.R.I.C. *Sixth Edition.* 74 Figures, including 3 Plates. 21s.

MEDICINE
Clinical, Laboratory, Therapeutic
By G. E. BEAUMONT, D.M., F.R.C.P., and E. C. DODDS, *M.V.O.*, M.D., F.R.S. *Twelfth Edition.* 42 Illustrations. 21s.

NEUROLOGY AND NEUROPSYCHIATRY
By W. RUSSELL BRAIN, M.A., D.M., F.R.C.P., and E. B. STRAUSS, M.A., D.M., F.R.C.P. *Fifth Edition.* 32 Illustrations. 18s.

OBSTETRICS AND GYNÆCOLOGY
By A. W. BOURNE, M.B., F.R.C.S., F.R.C.O.G., and L. WILLIAMS, M.D., M.S., F.R.C.S., F.R.C.O.G. *Sixth Edition.* 77 Illustrations. 18s.

PATHOLOGY
By G. HADFIELD, M.D., F.R.C.P., and L. P. GARROD, M.D., F.R.C.P. *Fifth Edition.* 60 Illustrations. 21s.

PUBLIC HEALTH
By J. L. BURN, M.D., D.Hy., D.P.H. 82 Illustrations. 25s.

SEX AND REPRODUCTIVE PHYSIOLOGY
By J. M. ROBSON, M.D., D.Sc., F.R.S.Edin. *Third Edition.* 65 Illustrations. 21s.

ANTENATAL AND POSTNATAL CARE
By F. J. BROWNE, M.D., D.Sc., F.R.C.S. Edin., F.R.C.O.G. *Sixth Edition.* 90 Illustrations. 25s.

A SHORT TEXTBOOK OF SURGERY
By C. F. W. ILLINGWORTH, *C.B.E.*, Ch.M., F.R.C.S. Edin. *Fourth Edition.* 12 Plates and 227 Text-figures. 30s.

SYNOPSIS OF HYGIENE (Jameson and Parkinson)
By G. S. PARKINSON, *C.B.E., D.S.O.*, M.R.C.S., D.P.H. Assisted by KATHLEEN M. SHAW, *M.B.E. Ninth Edition.* 16 Illustrations. 28s.

PATHOLOGY
An Introduction to Medicine and Surgery
By J. H. DIBLE, M.B., F.R.C.P., and T. B. DAVIE, M.D., F.R.C.P. *Second Edition.* 395 Illustrations (8 in colour). 48s.

DISORDERS OF THE BLOOD
Diagnosis, Pathology, Treatment and Technique
By Sir LIONEL WHITBY, *C.V.O., M.C.*, M.D., F.R.C.P., D.P.H., and C. J. C. BRITTON, M.D., D.P.H. *Fifth Edition.* 15 Plates (10 in colour) and 71 Text-figures. 30s.

PRINCIPLES OF HUMAN PHYSIOLOGY (Starling)
By C. LOVATT EVANS, D.Sc., F.R.C.P., F.R.S. *Ninth Edition.* 668 Illustrations (7 in colour). 40s.

DISEASES OF THE SKIN
Fifth Edition. By J. H. SEQUEIRA, M.D., F.R.C.P., J. T. INGRAM, M.D., F.R.C.P., and R. T. BRAIN, M.D., F.R.C.P. 63 Coloured Plates and 380 Text-figures. 63s.

CHILD HEALTH AND DEVELOPMENT
By various authors. Edited by RICHARD W. B. ELLIS, *O.B.E.*, M.A., M.D., F.R.C.P. 49 Illustrations. 18s.

J. & A. CHURCHILL Ltd. 104 GLOUCESTER PLACE W.1

THIRD EDITION

HANDBOOK OF MEDICINE FOR FINAL YEAR STUDENTS

By G. F. WALKER, M.D., M.R.C.P.

Price 21/- net

Indispensable to the Student and Practitioner

WHAT THE REVIEWERS SAY

"We are so enthusiastic about the book that we cannot but say to our colleagues—'Whatever hundreds of medical books you have, get this one.'"—*South African Medical Journal.*

"This little book is designed primarily for the benefit of the final year students in medicine but is well adapted also for the use of internes, specialists, and practitioners who find themselves in need of a 'refresher.' It meets this need very adequately."—*Canadian Medical Association Journal.*

"It lays especial stress upon the more important common conditions and upon various clinical matters almost disregarded by the average student. The material is sound and is set out in a most fascinating manner and wastes no time in perpetuating clinical myths."—*St. Mary's Hospital Gazette.*

"This individual little book will satisfy yet others who need at once a rapid summary of clinical medicine and a stimulus to keep awake while reading."—*University College Hospital Magazine.*

"Should be of great value to the final year student, who needs to have his knowledge clearly and concisely tabulated in the foreground of consciousness."—*King's College Hospital Gazette.*

"Will be welcomed by a large number of medical students preparing for their various qualifying examinations."—*The London Hospital Gazette.*

"Contains an extremely helpful account of the methods of medical diagnosis with a continual emphasis on the practical aspect of the art."—*Charing Cross Hospital Gazette.*

"Originality and sound perspective have raised this book out of the ranks of the synopses, while a grasp of the essential has enabled the writer to cover the wide range of medicine in a remarkably short space. We enjoyed the break-away from the classical text-book style, the approach to the subject from the clinical aspect."—*Charing Cross Hospital Gazette.*

"To have covered such an enormous field and yet to have brought all this material within the bounds of such a handy little volume, scarcely greater than pocket-book size, is a feat of which Dr. Walker may well feel proud."—*Cambridge University Medical Society Magazine.*

Obtainable from all medical booksellers or directly from

SYLVIRO PUBLICATIONS LTD.

19, WELBECK STREET LONDON, W.1

WRIGHT'S PUBLICATIONS

JUST PUBLISHED

8½ × 5½ in. 464 pp. 83 Illustrations and 43 plates 25s. net; postage 8d.
(Almost entirely sold)

MEDICAL ANNUAL 1947

An alphabetically arranged Review of the Year's Progress in Medicine and Surgery

Edited by

SIR HENRY TIDY, *K.B.E.*, M.A., M.D., F.R.C.P.
and
A. RENDLE SHORT, M.D., B.S., B.Sc., F.R.C.S.

With the collaboration of 45 Distinguished Contributors

Just Published Second Edition Fully Revised
8½ × 5½ in. 335 pp. 25s. net; postage 8d.

TREATMENT OF SOME CHRONIC AND 'INCURABLE' DISEASES

By A. T. TODD, *O.B.E.*, M.B., Ch.B., M.R.C.P.

Bristol: JOHN WRIGHT & SONS LTD.
London: SIMPKIN MARSHALL (1941) LTD.

Libby's

HOMOGENIZED FOODS

Easy to digest SOUPS & VEGETABLES

for Babies . . . *and for special diets*

By Libby's patented process of Homogenization ★ the cells containing the valuable food elements of Vegetables, Soups and Fruits are broken open making the nutriment readily assimilable by the most delicate digestive system. Also, tough irritating fibres are eliminated and the bulk evenly spread throughout the product. Thus it is possible to give all the goodness of these foods at a very early age — without the digestive strain which would normally ensue. Excellent, too, for adults requiring a smooth diet.

★ Homogenized Foods have been forced through tiny valves under high pressure — a much more effective process than the usual 'straining' through wire meshes. Clinical data and laboratory reports gladly supplied on request. Write to Libby, McNeill & Libby Ltd., Forum House, 15/16 Lime Street, London, E.C.3.

Libby, McNeill & Libby Ltd.
Forum House, 15 & 16 Lime Street, London, E.C.3

"OXOID"
Therapeutical Preparations

"PITOXYLIN"
BRAND

Pituitary Extract (Posterior Lobe)

Use *INDUCTION OF LABOUR*
UTERINE INERTIA
POST-PARTUM HAEMORRHAGE
SURGICAL SHOCK
DIABETES INSIPIDUS

Supplied

Bottles — 10 c.c. and 20 c.c.
(Strength — 10 I.U. per c.c.)

Ampoules — 0.5 c.c. and 1 c.c.
(Strength — 5 and 10 I.U. per c.c.)

Notes

"Pitoxylin" is Protein free. Further information on this preparation may be obtained from "Oxoid" Leaflet No. 123.

OXO LIMITED (Medical Dept.)
Thames House, Queen St. Place, London, E.C.4

The plumber had trouble with a cataract . . .

It is one of the curiosities of English dictionaries that the same word can be defined as 'a rush of water; an eye-complaint'. The first may mean a job for the plumber, the second may send him to hospital for an operation.

Ophthalmic operations are among those for which Soluble Thiopentone-Boots is particularly suitable as a total anæsthetic. The eyes remain fixed, and after-sickness is negligible.

Soluble Thiopentone-Boots is an intravenous anæsthetic of proved value under widely varying conditions. Extensively used as a transient basal anæsthetic, it has given equally good results as a total anæsthetic for short minor operations and for long operations not requiring great muscular relaxation.

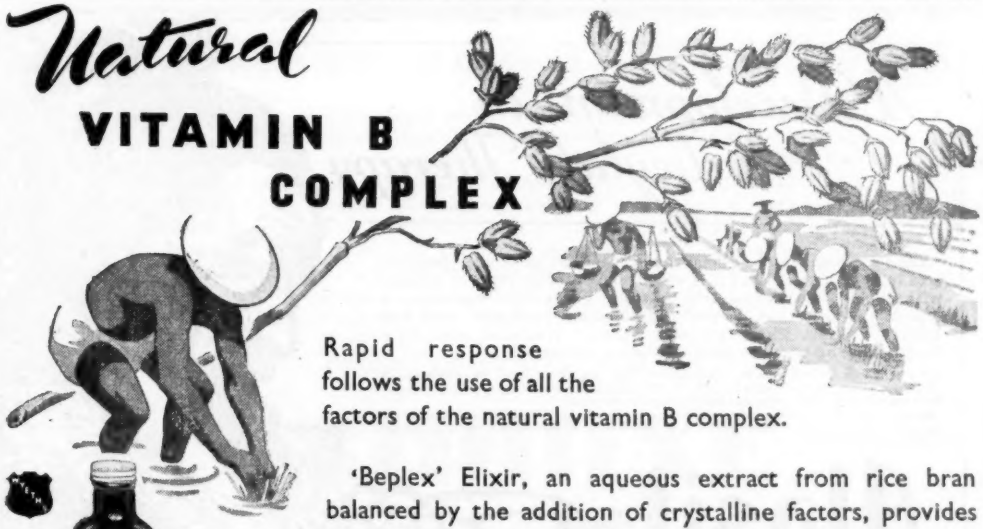
Soluble Thiopentone is a mixture of 100 parts by weight of the mono-sodium derivative of 5-ethyl-5-(1-methylbutyl)-thiobarbituric acid, and 6 parts by weight of exsiccated sodium carbonate, as laid down in the B.P. Addendum VII. Available in Boxes of 6 and 25 ampoules of 0.5 gm. and 1.0 gm.

SOLUBLE THIOPENTONE-BOOTS

Further information will be gladly sent on request to the Medical Department
BOOTS PURE DRUG CO. LTD., NOTTINGHAM
D.8

Natural

VITAMIN B COMPLEX



Rapid response follows the use of all the factors of the natural vitamin B complex.

'Beplex' Elixir, an aqueous extract from rice bran balanced by the addition of crystalline factors, provides an economical, palatable form of natural B complex.

'BEPLEX' VITAMIN B COMPLEX ELIXIR

JOHN WYETH & BROTHER LIMITED, CLIFTON HOUSE, EUSTON ROAD, LONDON, N.W.1

Hastens convalescence

IDOZAN

RAPIDLY RESTORES THE NORMAL HAEMOGLOBIN LEVEL.

(1) One tablespoonful contains 0·75 gm. (12 grs.) of pure iron (Fe).

(2) Palatable and readily assimilated.

(3) Does not constipate, or discolour the teeth.

(4) Well tolerated by children and adults and is innocuous to the most sensitive gastric mucosa.

IN CONVALESCENCE, DEBILITY AND ANÆMIA—MODERN IRON THERAPY AT ITS MAXIMUM THERAPEUTIC EFFICIENCY.

Stocked by all Pharmacists. 8, 40 *and* 80 *oz. Bottles.*

Manufactured in Great Britain by :

COATES & COOPER LTD.

NORTHWOOD - MIDDLESEX - ENGLAND

A Development in Salicylate Therapy

'Alasil' presents the beneficial therapeutic effects of acetylsalicylic acid in such a form that it is readily acceptable, even to patients with finely balanced digestive systems. This high tolerability is due to the fact that 'Alasil' combines acetylsalicylic acid with Dibasic Calcium Phosphate and 'Alocol' (Colloidal Aluminium Hydroxide), an effective gastric sedative and antacid.

For this reason 'Alasil' can be administered with confidence in all the conditions in which such an agent is indicated, while its use affords the advantage of greater freedom from the possibility of unpleasant gastro-intestinal sequelæ.
'Alasil' is, therefore, an analgesic, antipyretic and antirheumatic which can be prescribed for patients of all ages. Moreover, it is so well tolerated that its use can be continued to the desired extent.

Alasil

A supply for clinical trial with full descriptive literature sent free on request

A. WANDER LTD., *Manufacturing Chemists*, 5 and 7, Albert Hall Mansions, London, S.W.7

A Product of the 'Ovaltine' Research Laboratories

M324

Two advances in Opiate Medication

DILAUDID

TRADE MARK *dihydromorphinone* BRAND

Improved Morphine Preparation

Whilst the analgesic power of "Dilaudid" is five times as great as morphine, its hypnotic effect is considerably weaker. The euphoric element is largely subdued and the risk of addiction correspondingly lowered. Tolerance is greatly improved, an increase of dosage rarely necessary. The effect on peristalsis is only slight and much less persistent than in the case of morphine.

In oral and hypodermic tablets, ampoules and suppositories

DICODID

TRADE MARK *dihydrocodeinone* BRAND

Powerful Antitussive

Occupying, with respect to its action, a place midway between morphine and codeine, "Dicodid" exerts a specific and selective influence on the cough centre. The absence of any notable constipating effect is responsible for the use of "Dicodid" as a post-operative analgesic. Better tolerated than morphine, "Dicodid" also interferes very much less with expectoration.

In oral tablets and ampoules

Further information and samples on request:

KNOLL LIMITED, 61, Welbeck Street, LONDON, W.1

Sole Distributors: **Savory & Moore Ltd., 26, Lawrence Road, Tottenham, N.15**

K.37a

★ *Presenting a Star of hope in petit mal . . .*

Tridione is Abbott's newly developed synthetic drug, 3, 5, 5-trimethyloxazolidine-2, 4-dione, which has been demonstrated clinically to have a definite inhibiting effect on petit mal, myoclonic and akinetic seizures in epilepsy. Tridione is indicated in the treatment of petit mal, myoclonic and akinetic epilepsy in cases diagnosed by the typical "spike and wave" electroencephalogram or by clinical features alone. It is most effective in idiopathic epilepsy, but it may be used in epilepsy due to organic brain injury if attacks of the type mentioned are present. In certain patients with mixed grand mal and petit mal epilepsy it has been effective as an anti-convulsant in combination with other drugs, particularly phenobarbital. Tridione is supplied in 0·3-gm. capsules, bottles of 100.

Literature will be sent on request.

★ **TRIDIONE**

(3, 5, 5-TRIMETHYLOXAZOLIDINE-2, 4-DIONE, ABBOTT)

AN ENTIRELY NEW COMPOUND DEVELOPED BY ABBOTT LABORATORIES

TRADE Abbott MARK

ABBOTT LABORATORIES (ENGLAND) LTD., WADSWORTH RD., PERIVALE, MIDDX.

To combat the Depression of Chronic Organic Disease

Many patients with chronic organic disease sink into a persistent depression, characterized by discouragement and even despair. Unless effectively combated, this depression may intensify the symptoms of the basic disorder and handicap its treatment. By restoring optimism and interest in useful living, 'Benzedrine' Tablets often help to overcome prolonged depression accompanying chronic illness and thus facilitate the general management of the case.

'BENZEDRINE' TABLETS

Each tablet contains 5 mg. β-aminopropylbenzene sulphate (amphetamine sulphate)

MJ LIMITED

Sample and literature sent on the signed request of physicians

MENLEY & JAMES LIMITED

123 COLDHARBOUR LANE, LONDON, S.E.5

For Smith, Kline & French Laboratories

BTC 3

Gentle Peristaltic Action

Agarol provides an exceptionally stable emulsion of pure medicinal mineral oil which softens the intestinal contents and lubricates the intestinal tract. The highly purified white phenolphthalein present stimulates peristalsis. Thus Agarol adequately furnishes the three principal requirements for the relief of constipation: softening, lubrication, peristaltic stimulation.

Quietly, gently, the stream follows its course, typifying the action of Agarol in its passage through the colon.

AGAROL

WILLIAM R. WARNER & CO. LTD.,
Power Road, London, W.4.

25

OTITIS MEDIA

DECONGESTION OSMOSIS WITH REMEDIAL ANALGESIA

DECONGESTION SUCCESSFULLY ACHIEVED by the addition of Ephedrine Sulphate which acting in synergy with the other ingredients produces shrinkage of the mucosa, promotes drainage from the middle ear and a rapid control of pain. The bactericidal constituents of Auralgicin cover a wide range of micro-organisms including those likely to be present in otitis media.

AURALGICIN DDA

(*BENGER*)

Each ml. contains:

Phenazonum	0·050 g.	Papaveretum ..	0·025 g.
EPHEDRINE SULPH. ..	0·01 g.	Chlorbutol	0·010 g.
Pot. Hydroxyquinolin Sulph. ..	0·001 g.		

Glycer ad 1 ml.

FOR EXTERNAL APPLICATION

BENGER'S LTD., HOLMES CHAPEL, CHESHIRE

8

NOW AVAILABLE

"Dihydroergotamine–Sandoz"

(LABORATORY NUMBER D.H.E.45)

An Improved Sympathetic Sedative and Vasodilator with no constrictor action on the Uterus

This new semi-synthetic alkaloid possesses a similar action to ergotamine in migraine and in sympathicotonias. The toxicity of the new alkaloid is reduced, the constrictor action on the uterus and vessels is absent and the sympathicolytic activity is enhanced. "Dihydroergotamine–Sandoz" is available in 1 cc. ampoules and bottles of oral solution. The oral solution is so far in limited supply.

Further particulars from

SANDOZ PRODUCTS LIMITED

134 Wigmore Street, London, W.1

For the Administration of Orally-active Estrogens and Thyroid

HORMOTONE "T"

New Potency

containing in each tablet 1,000 international units natural estrogenic hormones combined with 1/10 grain thyroid

HORMOTONE "T"

acts directly upon the endometrium inducing hyperplasia of the uterine mucosa. Indicated in cases of estrogenic deficiency, including menopausal symptoms, amenorrhœa and hypomenorrhœa

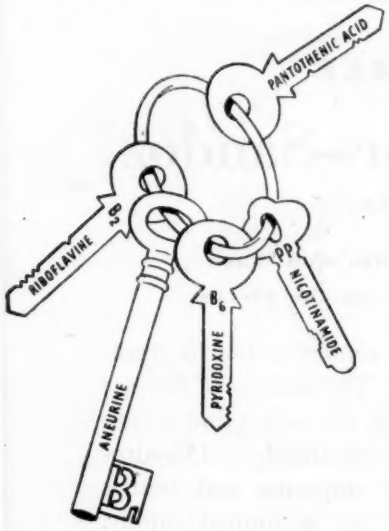
Bottles of 40 *and* 250 *specially coated tablets*

Professional samples available to members of the Medical Profession

Manufactured in England for

G. W. CARNRICK CO., NEWARK, NEW JERSEY, U.S.A.

Distributors : Brooks & Warburton, Ltd., 232-242 Vauxhall Bridge Road, London, S.W.1



FIVE important B-complex vitamins are combined in reasonable, well-proportioned doses in

'BECOSYM'

VITAMIN B-COMPLEX

Each tablet contains :

1 mg. vitamin B_1 (aneurine, thiamin) 1,000 gammas
2 mg. vitamin B_2 (riboflavine) 2,000 gammas
20 mg. nicotinamide (P.P. factor) 20,000 gammas
2 mg. vitamin B_6 (pyridoxine) 2,000 gammas
3 mg. calcium pantothenate, 3,000 gammas

The treatment of disorders due to a deficiency of one or two factors often necessitates the administration of additional vitamins of the B-complex. Even when one deficiency symptom is predominant, calling for the administration of large doses of one specific vitamin, the use of 'Becosym' is desirable.

DOSES

For prophylactic use one to two 'Becosym' tablets daily may be sufficient, and therapeutically one to two tablets three times a day.

PACKINGS

'Becosym' tablets are issued in bottles of 25, 100 and 500. A sample of a standard packing of 25 'Becosym' tablets is at the disposal of medical practitioners.

ROCHE PRODUCTS LIMITED, WELWYN GARDEN CITY, HERTS

Vitamin K for Painless Injection

'SYNKAVIT'

VITAMIN K

a Roche discovery, is used in an ever-widening field of therapeutic indications. A recent report claims vitamin K to be effective in the treatment of

CHILBLAINS : The average dose of 20 mg. twice daily was found most useful. Initial parenteral treatment is recommended.

Samples of oral tablets, ampoules and literature on request

ROCHE PRODUCTS LIMITED, WELWYN GARDEN CITY, HERTS

Scottish Depot : 665 Great Western Road, Glasgow, W.2

M&B Preparations of Penicillin

In addition to Penicillin calcium and sodium salts, the following M&B preparations of Penicillin are available:

Penicillin Dental Cones — M&B each containing
Penicillin (calcium salt) 1,000 int. units
Sulphanilamide gr. ½
Sulphathiazole gr. ½
containers of 10 and 100

Penicillin Eye Ointment — M&B (1,000 int. units per gramme)
tubes of 5 Gm.

Penicillin Lozenges — M&B each containing 500 int. units
containers of 25, 50 and 500

Penicillin Oil-Wax Suspension — M&B (two strengths, 125,000 int. units and 300,000 int. units per c.c.)
vials of 10 c.c.

Penicillin Ointment — M&B (500 int. units per gramme)
containers of 1 oz.

Fuller information is available on request

manufactured by

MAY & BAKER LTD.

distributors

PHARMACEUTICAL SPECIALITIES (MAY & BAKER) LTD. DAGENHAM

47139

Increased capillary fragility, with its attendant risk of submucous or subcutaneous hæmorrhage, is the primary indication for the therapeutic use of Rutin, a flavonol glycoside credited with the physiological properties hitherto ascribed to vitamin P.

Clinical trials, some of which were summarised in the *British Medical Journal*, May 31st, 1947, page 771, suggest that Rutin may be an important factor in the prevention of retinal hæmorrhage in patients with hypertension, and in controlling bleeding in hereditary telangiectasia.

Rutin A & H is suggested for administration in hæmorrhagic conditions due to increased capillary permeability associated with hypertension, nutritional deficiency or toxic effects of drugs.

Rutin Tablets, each containing 20 mg., are available in bottles of 100.

RUTIN A & H

Literature and price on application.

ALLEN & HANBURYS LTD · LONDON · E2
PHONE BISHOPSGATE 3201 12 LINES WIRES GREENBURYS HETH LONDON

A HEPATIC SYNDROME OF WIDE DISTRIBUTION

ILLUSTRATED BY LESIONS IN MALARIA AND BLACKWATER FEVER

BRIAN MAEGRAITH M.B. Adelaide, M.A., D. Phil. Oxfd
W. H. HORNER ANDREWS M.A., B.M. Oxfd
DAVID GALL B.M. Oxfd

From the Department of Tropical Medicine, Liverpool School of Tropical Medicine

CLINICAL manifestations of liver disease may appear in all forms of human malaria at any stage. They are most common in *P. falciparum* infections, and extreme examples present the syndrome of bilious remittent fever in which the liver is enlarged and tender, jaundice appears early, associated with either the indirect or biphasic van den Bergh reaction, and there is bilious vomiting with severe and often intractable diarrhœa. Bilirubin is usually, but not always, present in the urine (Manson-Bahr 1945, Fairley 1932–33). A clinical picture very similar to bilious remittent fever sometimes develops in blackwater fever.

Henry (1932) maintains that the liver is always affected in malaria, but this view is not widely accepted. Nevertheless in uncomplicated malaria there may be enlargement of the liver with some jaundice and other signs of liver disturbance, including deviations in serial hepatic-function tests and the passage in the urine of bilirubin, urobilin, and urobilinogen (Rudolf 1927, Kern and Norris 1944, Hughes and Bomford 1944, Kean and Smith 1944, Kopp and Solomon 1943, Mirsky et al. 1944, O'Leary et al. 1929, Lippincott et al. 1945, 1946, Fredricks and Hoffbauer 1945, Carter and MacLagan 1946, Glenn et al. 1946).

LIVER CHANGES IN MALARIA AND BLACKWATER FEVER

In active malaria associated with deviations in hepatic-function tests liver-biopsies have occasionally been performed and have revealed no evidence of structural alterations (Fredricks and Hoffbauer 1945). In fatal cases, however, important pathological changes are often observed.

At necropsy after acute malaria the liver is usually enlarged and varies from dark red to black according to the amount of pigment present. The cut surface bleeds easily and is often fatty. Occasionally there are small hæmorrhages in the central regions of the lobules.

The histological picture is one of central zonal degeneration and necrosis. The lobules are indistinctly demarcated. The congested organ shows the central vein and its tributary sinuses filled with erythrocytes, many of which contain parasites. When anæmia is severe, the central vein and sinuses appear dilated and empty. There is little evidence of stasis or thrombosis in the blood-vessels, whose endothelium is not much affected.

Some writers have recorded "mechanical obstruction" of the sinuses and occasionally of the larger blood-vessels by collections of pigmented macrophages, free parasites, and pigment; stasis; thrombosis; and agglutination of erythrocytes, some containing parasites. Such obstruction appears to be rare. Klotz (1929), for instance, found no evidence of it in patients who died of malignant tertian malaria in West Africa, and he stated that, so far as vascular occlusion was concerned, the picture in the liver in *P. falciparum* infections was "nothing like" that in the brain.

The Kuppfer cells and the littoral cells of the sinuses are often grossly swollen and filled with erythrocytes, parasites, and debris. These swollen cells appear in places to obstruct the lumen of the sinuses. The columns of polygonal cells are often widely separated and appear to be distorted and pushed apart by the hypertrophied Kuppfer cells.

The polygonal cells contain hæmosiderin but not malarial pigment. They may show only mild acidophilic granular degenerative changes, but fatty degeneration is common and is most evident in the cells of the central zone of the lobule or, when these cells are necrotic, in the cells at the periphery. More severe degeneration and necrosis have often been reported in human and animal malaria and in blackwater fever.

Klotz (1929) has provided one of the clearest descriptions of the liver lesions. In patients who died of *P. falciparum* infections the appearance of the cut surface of the liver was one of "reversed nutmeg details," the lobules showing a yellowish-grey centre and a peripheral red zone. Necrosis of the liver cells was found in the inner two-thirds of the lobule and was most prominent in those cells surrounding the central vein. In this region the cytoplasm was granular, vacuolated, fatty, and acidophilic, and the nuclei stained feebly or were pyknotic, broken up, or absent. The necrosis was sharply limited, and the cells at the periphery of the lobule were relatively unaffected. The central veins and sinusoids were deeply congested. Klotz believed this dilatation was very significant and developed before the changes in the hepatic cells.

Similar changes have been observed by other workers in human and simian malaria (Rigdon and Stratman Thomas 1942, Kean and Smith 1944, Taliaferro and Cannon 1936, Taliaferro and Mulligan 1937, Gaskell and Millar 1920, Dudgeon and Clarke 1919).

Some degree of atrophy of the polygonal cells is also commonly seen in malaria. Gaskell and Millar (1920), for instance, described "rows of shrunken cells" in the central zone of the lobule. The atrophic cells show reduction of cytoplasm, which is often fragmented, and some minor changes in the nuclei.

In severe malaria and blackwater fever the bile in the gall-bladder is tarry and inspissated, and the liver cells may show evidence of biliary obstruction, with the canaliculi distended with greenish bile. These cellular changes are again most prominent in the central zone of the lobule. Occasionally, even in the presence of severe central necrosis, there may be no apparent biliary changes (Whipple 1909, Dudgeon 1920, Paterni 1923, Klotz 1929).

Cellular infiltration of Glisson's capsule has been described, especially in cases with a history of long-sustained or frequently recurring attacks of malaria. The cells are lymphocytic in type and do not usually invade the cells of the lobules. They are confined as a rule to the region of the portal vessels.

PATHOGENESIS OF CENTRAL-ZONE HEPATIC NECROSIS

Vascular Changes

The hepatic lesions in malaria in many ways resemble those developing in right-sided heart-failure, associated with tissue anoxia arising from interference with the escape of venous blood from the liver. In a few cases of malaria the effects of a failing heart probably contribute towards the pathological changes in the liver (Gaskell and Millar 1920), but in most cases almost identical liver lesions appear without any evidence of cardiac failure. This is especially true of blackwater fever, in which liver lesions are very common and cardiac failure is rare except as a strictly terminal event. Some patients in whom liver lesions are well developed die in a state resembling shock (Atchley 1930), a condition in which right-heart failure does not occur and indeed the venous return to the heart is much reduced; hence "back-pressure" effects originating in the vena cava cannot play any part in the production of the liver changes (Wiggers 1918, Mann 1919, Moon 1938, Rigdon 1942, Maegraith 1944). The similarity of the lesions

of shock to those of "passive" congestion in the liver as well as other organs has been emphasised by Moon (1938).

Some explanation other than right-sided heart-failure must therefore be sought to explain the hepatic lesions in most cases of malaria and blackwater fever. The congestion and dilatation of the lobular vessels may result from obstruction to the blood-flow arising from changes in the vessels themselves. The blood-flow through the vessels may be to some extent inhibited by: (1) intravascular agglutination of red cells, which occurs, however, only late in the disease; (2) stasis or thrombosis, of which there is very little firm evidence (stasis might be expected to follow changes in the endothelium leading to increased permeability, but in the liver the endothelial cells are physiologically so permeable that no further appreciable local loss of fluid takes place even when the cells are damaged); and (3) mechanical effects arising from hypertrophy, hyperplasia, and degeneration of the Kuppfer and littoral cells.

The balance of histological evidence indicates that these processes can affect the flow through the lobule only slightly. There must therefore be some other form of resistance to the venous flow, and this is most probably an active obstruction due to constriction of some elements of the hepatic venous vessels. Such constriction would reduce the hepatic venous outflow, and it is probably this reduction of venous flow and the associated anoxia arising from it which give rise to the hepatic lesions observed. The syndrome of Chiari (1899) illustrates well the effects of obstruction to the hepatic veins. Here the orifices of the larger veins are obstructed by thickening of the intima and sometimes suddenly by thrombosis. When the obstruction is acute, the cells of the central zone of the lobules are completely destroyed and there is intense congestion of the central vein and its tributary sinuses. In cases of more gradual development there is "extensive atrophy" of the hepatic cells in the centre of the lobule with distension of the central vein and sinuses. Thompson and Turnbull (1911) observed that in this syndrome there is a "remarkable association of a liver showing extreme atrophy with venous congestion with a heart in which there is no evidence of chronic embarrassment."

This picture is the same as that seen in malaria, in which there is neither constant cardiac failure nor any evidence of thrombosis or other anatomical occlusion of the hepatic veins. Since interference with the drainage of venous blood from the hepatic lobules arises somewhere between the lobule and the vena cava, there must be obstruction (presumably vascular constriction) in the hepatic venous tree.

Cellular Changes

The vascular changes discussed above lead to slowing of the intralobular circulation and to progressive stagnant anoxia (Peters and Van Slyke 1931) interfering with the oxygen supply to the tissue cells. Cellular damage arising from this anoxia is at first reversible, but finally becomes irreversible and goes on to degeneration and necrosis. This anoxia is probably the principal cause of the changes found in the liver cells, but there are contributory factors in malaria which aggravate the anoxia arising from the intralobular circulatory incompetence. The invasion of erythrocytes by the plasmodia leads to a lowering of the oxygen-carrying capacity of the infected cells, and the anoxæmia so produced is augmented by the anæmia arising from the destruction of both infested and non-infested cells. These general processes may be further enhanced in malaria, but not in blackwater fever, by the local tissue effects of diffusible products of the parasitic metabolism, such as pyruvic acid, lactic acid, and possibly other substances released at sporogony of the parasites. The malarial pigment is not involved (Anderson and Morrison 1942). In the production of the final picture of degeneration and necrosis other factors are also involved, including the nutritional status of the patient and the hypoproteinæmia prevailing in many cases.

It is possible also that the anoxic state of the hepatic tissue, or some change in it arising indirectly from the malarial infection, produces changes in the constituents of the cells and renders them auto-antigenic and capable of producing anti-liver-cell antibodies which react with the antigens and cause tissue damage. Gear (1946) has suggested that some process of this sort may be involved in the lysis of erythrocytes in malaria and has shown that the yellow-fever virus will produce auto-antigens in rhesus-monkey livers.

There is no need here to discuss these contributory factors in detail, since there is ample evidence to show that the essential factor in the cellular changes is anoxia resulting from alterations in intralobular blood circulation. It is not very easy to see, however, why the lesion should be centrally placed, since pure stagnant anoxia should affect all areas of the lobule equally. Possibly the depleted oxygen-carrying powers of the blood are concerned here, and the tissue at the periphery of the lobule, which receives the arterial blood first, has a better opportunity of securing its oxygen supply than that in the centre of the lobule. Specific sensitivity of the central cells to chemical poisons and some kind of collateral circulation between sinuses in the periphery of the lobule have also been suggested, without much supporting evidence.

MALARIA AS AN EXAMPLE OF A GENERAL PROCESS

We have seen that the hepatic lesions of malaria and blackwater fever are similar. In severe cases the picture is one of dilatation and possibly congestion of the central lobular veins and tributary sinuses. There is degeneration and necrosis of the polygonal cells of the central zone of the lobule, resulting, so far as can be judged, from anoxia arising mainly from obstruction to the venous outflow from the liver.

The conditions referred to above are clearly anoxic, but the central zonal necrosis often appears in circumstances which are not so obviously anoxic. For instance, it is not easy to see at first sight how anoxia could develop in chloroform or carbon-tetrachloride poisoning, except in the form of histotoxic anoxia arising from the direct action of the chemical agent on the tissue oxidation systems (Keilin 1925). The same difficulty arises in explaining the liver lesions in burns and many of the experimental procedures such as ligation of the portal vein or hepatic artery and the production of Eck's fistula. We believe that the only explanation can be that in all these conditions there is an alteration in the intrahepatic blood-flow which leads to stagnant anoxia. This still does not explain the central distribution of the degeneration, and it seems necessary to postulate also either some process whereby most of the oxygen of the blood is removed by the cells in the periphery of the lobules, such as we have mentioned elsewhere, or the shunting of blood away from the centre of the lobule so that the peripheral cells receive a better supply than those in the centre.

No particular specific agent has been implicated in the pathogenesis of the liver lesions in either malaria or blackwater fever. These lesions may therefore be regarded as examples of a general pathological reaction, the non-specific nature of which is emphasised by the wide variety of clinical conditions in which it occurs. Thus central lobular necrosis has been recorded in right-sided heart-failure; poisoning by various chemical agents, such as chloroform (Whipple and Sperry 1909); heat hyperpyrexia (Malamud et al. 1946); severe burns (Hartman and Romence 1943), especially after tanning (Wilson et al. 1938, Erb et al. 1943); acute postoperative

necrosis of the liver (Sutton 1943); various allergic reactions; pernicious anæmia; secondary anæmias, including severe hæmorrhage; and babesia infections in dogs. Experimentally, similar lesions have been produced by the administration of various poisons, such as carbon tetrachloride and phosphorus (Williamson and Mann 1923), by long exposure of animals to low atmospheric oxygen tensions (Rosin 1928, Rich 1930), and on occasions but not always (Cameron and Mayes 1930) by interference with the blood-supply to the liver (Rous and Larimore 1920, Bainbridge and Leathes 1906–07, Behrend et al. 1922, Whipple and Hooper 1916).

The appearance of identical pathological changes in such diverse conditions indicates a common factor. It is our contention that the lesions develop primarily because of alterations in intrahepatic blood-flow, and that the cellular changes are brought about by localised anoxic conditions.

Rous and Larimore (1920) obtained central necrosis by ligating branches of the portal vein, and they considered it arose from venous "back pressure." They noted, however, that "atrophy is least at the periphery of the lobule where oxygenation is most." MacCallum (1928), Resnik and Keefer (1925–26), and Rich and Resnik (1926) studied the development of central zonal degeneration under various conditions and concluded that the basis of the lesion was deficient oxygenation of the blood, which progressively increased from the periphery to the centre of the lobule. Rich (1930) examined livers from many cases of anæmia and found central degeneration in all of them; dietetic factors had been excluded. He concluded that "atrophy and central necrosis will occur as the result of anoxæmia in the absence of heart-failure, and in the absence of any evidence of passive congestion of the heart, spleen, or other organs." Anoxia, therefore, whether due to anæmia, stagnant circulatory conditions (right-heart failure), or lowered oxygen tension in the respired air, will produce central zonal cellular changes in the lobules.

In the absence of right-heart failure, as we have seen in malaria, the stagnant anoxia in the liver probably arises from active obstruction to the venous outflow, which leads—for example, in Chiari's disease—to a centrally placed lobular lesion. We suggest that the obstruction to the venous outflow arises from constriction of some or all of the hepatic venous tree, and that this is the basic mechanism in the production of the lesions in the conditions referred to. (There is evidence that this may also be the case in heart-failure.)

Acute constriction of the hepatic veins in dogs is readily produced by anaphylactic shock (Simonds and Brandes 1927), the trigger dose giving rise to a rapid swelling of the liver, a fall in blood-pressure, and a diminution of venous return to the heart. The hepatic venous flow is greatly reduced. On section the vessels are found to be intensely congested, the maximal effect being on the central and tributary sinuses. Similar obstruction to the hepatic venous flow may be produced by histamine (Mautner and Pick 1929) and peptone (Simonds and Brandes 1929).

Bauer et al. (1932) obtained clear evidence, in perfusion experiments, of the existence of a "sphincter-like" mechanism which could regulate to some extent the venous outflow from the dog's liver. This "sphincter" could be activated by histamine and relaxed by stimulation of the sympathetic nerves to the liver or by small doses of adrenaline. It was located near the caval ostia of the hepatic veins. Physiological evidence of a similar "sphincter" has not been obtained in man, but there is some anatomical evidence suggesting that the musculature of the larger hepatic veins may be specialised to act as sphincter. If such a hepatic venous sphincter does exist in man it presumably reacts to shock and histamine by constriction, which would explain the hepatic lesions of, for example, algid malaria and blackwater fever. There may be constriction of any part of the venous tree, including small vessels like the sublobular veins, or large vessels like the hepatic veins, or even the hepatic vena cava.

Deysach (1941) has brought forward evidence for the existence of "sluice vessels" which drain directly from the sinusoids into the sublobular veins; these were present in all mammals, independent of the degree of musculature of the hepatic veins, and their constriction impeded venous drainage.

The mechanism of the reflex is still highly speculative. Since the classical experiments of Francois-Franck and Hallon (1896) and Burton Opitz (1911–14) many observers have studied the effects of nerve stimulation and of adrenaline on the liver, both in situ (Griffith and Emery 1930, Edmunds 1915) and perfused (McMichael 1932, Bauer et al. 1932). The consensus of opinion is that both adrenaline and stimulation of the sympathetic nerves cause a diminished inflow of blood coupled with an increased outflow (see Franklin 1937). Bauer et al. (1932) go further and find that, whereas large doses of adrenaline reduce the outflow, smaller doses hasten it. Large doses of adrenaline lead to hepatic engorgement (Bainbridge and Trevan 1915) and even to central necrosis (Drummond 1904). Histamine (Baer and Rössler 1927, Mautner and Pick 1929), peptone, anaphylactic shock, and digitalis (Katz et al. 1938) all diminish the outflow from the liver of dogs. The effect of acetylcholine and of vagal stimulation is equivocal, no great change usually being noted; diminished outflow has, however, occasionally been recorded. Adrenaline reverses the effect of histamine and of peptone.

As we pointed out above, in the dog the ostia of the hepatic veins are surrounded by a thick coat of smooth muscle which appears in induced shock to be the primary factor in restricting the venous outflow (Arey and Simonds 1920). No such localised thickening of the venous wall is found in man, though Elias and Feller (1931) report that the smooth muscle present is capable of raising folds in the intimal wall. The smaller venous tributaries are, however, well supplied with muscle, and various observers believe that resistance to venous outflow may also take place in these vessels (Bauer et al. 1932, Mautner and Pick 1929, Baer and Rössler 1927).

The initiation of the vascular changes in the liver is probably reflex in origin. In general states, such as shock, the reflex may be initiated by extrahepatic stimulation and represent part of a generalised, possibly protective, mechanism designed to restrict the blood-flow through the viscera. It is interesting to note here the frequent association of renal and hepatic changes. Possibly the so-called hepatorenal syndrome has its origin in such reflex activity, whereby the central lobular lesions and those of renal anoxia (Maegraith et al. 1945) are simultaneously produced. In conditions in which the liver is primarily affected the process may be initiated solely by intrahepatic stimuli, possibly arising from the damage to the cells, or directly from toxic substances—e.g., chloroform—acting on them though there is evidence that so-called "liver poisons" are part of a generalised pathological process (Williamson and Mann 1923).

SUMMARY

The hepatic lesions in severe malaria and blackwater fever are distributed mainly in the central zone of the lobules.

The lesions are non-specific and are essentially similar to those of a great variety of other conditions.

The cellular changes develop primarily from anoxia.

We maintain that the lesions arise from stagnant anoxia resulting from active obstruction to the venous outflow from the liver, and that this arises from constriction of some part of the hepatic venous tree.

This constriction is brought about mainly by nervous reflexes which may have their origin within or outside the liver. In the latter case they probably explain the frequently reported relation between hepatic and renal disturbances.

Postscript.—Later evidence suggests that the vascular reflex described above is not the only intrahepatic mechanism causing centrilobular anoxia. Professor Himsworth has shown that swelling of the parenchymal cells may partially obstruct the flow of blood through the liver, giving rise to centrilobular degeneration. Working independently we have come to the conclusion that this happens with CCl_4 poisoning, though in some cases the reflex postulated above may contribute. We still believe that a vascular reflex is of great importance in producing centrilobular degeneration.

REFERENCES

Anderson, W. A. D., Morrison, D. B. (1942) *Arch. Path.* **33**, 677.
Arey, L. B., Simonds, J. P. (1920) *Anat. Rec.* **18**, 219.
Atchley, D. W. (1930) *J. Amer. med. Ass.* **95**, 385.
Baer, R., Rossler, R. (1927) *Arch. exp. Path. Pharmak.* **119**, 204.
Bainbridge, F. A., Leathes, J. B. (1906–07) *Biochem. J.* **1**, 25.
— Trevan, J. W. (1915) *J. Physiol.* **51**, 460.
Bauer, W., Dale, H. H., Poulsson, L. T., Richards, D. W. (1932) *Ibid.* **74**, 343.
Behrend, M., Radasch, H. E., Kershner, A. G. (1922) *Arch. Surg., Chicago*, **4**, 661.
Burton Opitz, R. (1911) *Quart. J. exp. Physiol.* **4**, 104.
— (1912) *Ibid*, **5**, 83, 189.
— (1914) *Ibid*, **7**, 57, 329.
Cameron, G. R., Mayes, B. T. (1930) *J. Path. Bact.* **33**, 799.
Carter, A. B., MacLagan, N. F. (1946) *Brit. med. J.* ii, 80.
Chiari, H. (1899) *Beitr. path. Anat.* **26**, 1.
Deysach, L. J. (1941) *Amer. J. Physiol.* **132**, 713.
Drummond, W. B. (1904) *J. Physiol.* **31**, 81.
Dudgeon, L. S. (1920) *J. Hyg., Camb.* **19**, 208.
— Clarke, C. (1919) *Quart. J. Med.* **12**, 372.
Edmunds, C. W. (1915) *J. Pharmacol.* **6**, 569.
Elias, H., Feller, A. (1931) *Z. ges. exp. Med.* **77**, 538.
Erb, I. H., Morgan, E. M., Farmer, A. W. (1943) *Ann. Surg.* **117**, 234.
Fairley, N. H. (1932–33) *Proc. R. Soc. Med.* **26**, 578.
Francois-Franck, C. A., Hallon, A. (1896) *Arch. Physiol. norm. path.* **8**, 908, 923.
Franklin, K. J. (1937) A Monograph on Veins, Springfield.
Fredricks, M. G., Hoffbauer, F. W. (1945) *J. Amer. med. Ass.* **128**, 495.
Gaskell, J. F., Millar, W. L. (1920) *Quart. J. Med.* **13**, 381.
Gear, J. (1946) *Trans. R. Soc. trop. Med. Hyg.* **39**, 301.
Glenn, P. M., Kaplan, L. I., Read, H. S., Becker, F. T. (1946) *Amer. J. med. Sci.* **212**, 197.
Griffith, F. R. jun., Emery, F. E. (1930) *Amer. J. Physiol.* **95**, 20.
Hartman, F. W., Romence, H. L. (1943) *Ann. Surg.* **118**, 402.
Henry, C. (1932) *Med. J. Aust.* i, 888.
Hughes, S. B., Bomford, R. R. (1944) *Brit. med. J.* i, 69.
Katz, L. N., Rodbard, S., Friend, M., Rottersman, W. (1938) *J. Pharmacol.* **62**, 1.
Kean, B. H., Smith, J. A. (1944) *Amer. J. trop. Med.* **24**, 317.
Keilin, D. (1925) *Proc. roy. Soc.* B, **98**, 312.
Kern, R. A., Norris, R. F. (1944) *Nav. med. Bull., Wash.* **43**, 847.
Klotz, O. (1929) *Amer. J. trop. Med.* **9**, 241.
Kopp, I., Solomon, H. C. (1943) *Amer. J. med. Sci.* **205**, 90.
Lippincott, S. W., Ellerbrook, L. D., Hesselbrock, W. B., Gordon, H. H., Gottlieb, L., Marble, A. (1945) *J. clin. Invest.* **24**, 616.
— Marble, A., Ellerbrook, L. D., Hesselbrock, W. B., Engstrom, W. W., Gordon, H. H. (1946) *J. Lab. clin. Med.* **31**, 991.
MacCallum, W. G. (1928) Textbook of Pathology, London, p. 469.
McMichael, J. (1932) *J. Physiol.* **75**, 241.
Maegraith, B. G. (1944) *Trans. R. Soc. trop. Med. Hyg.* **38**, 1.
— Havard, R. E., Parsons, D. S. (1945) *Lancet*, ii, 293.
Malamud, N., Haymaker, W., Custer, R. P. (1946) *Milit. Surg.* **99**, 397.
Mann, F. C. (1919) *Amer. J. Physiol.* **47**, 231.
Manson-Bahr, P. H. (1945) Manson's Tropical Diseases, London.
Mautner, H., Pick, E. P. (1929) *Arch. exp. Path. Pharmak.* **142**, 271.
Mirsky, I. A., von Brecht, R., Williams, L. D. (1944) *Science*, **99**, 20.
Moon, V. H. (1938) Shock and Related Capillary Phenomena, London.
O'Leary, P. A., Greene, C. H., Rowntree, L. G. (1929) *Arch. intern. Med.* **44**, 155.
Paterni, L. (1923) *Policlinico*, **30**, 543.
Peters, J. P., Van Slyke, D. D. (1931) Quantitative Clinical Chemistry, Baltimore.
Resnik, W. H., Keefer, C. S. (1925–26) *J. clin. Invest.* **2**, 389.
Rich, A. R. (1930) *Bull. Johns Hopk. Hosp.* **47**, 338.
— Resnik, W. H. (1926) *Ibid.* **38**, 75.
Rigdon, R. H. (1942) *Amer. J. Hyg.* **36**, 269.
— Stratman Thomas, W. K. (1942) *Amer. J. trop. Med.* **22**, 329.
Rosin, A. (1928) *Beitr. path. Anat.* **80**, 662.
Rous, P., Larimore, L. D. (1920) *J. exp. Med.* **31**, 609.
Rudolf, G. de M. (1927) Therapeutic Malaria, London.
Simonds, J. P., Brandes, W. W. (1927) *J. Immunol.* **13**, 1.
— — (1929) *J. Pharmacol.* **35**, 165.
Sutton, J. E. (1943) *Ann. Surg.* **118**, 149.
Taliaferro, W. H., Cannon, P. R. (1936) *J. infect. Dis.* **59**, 72.
— Mulligan, H. W. (1937) *Indian med. Res. Mem.* no. 29, p. 1.
Thompson, T., Turnbull, H. M. (1911) *Quart. J. Med.* **5**, 277.
Whipple, G. H. (1909) *Malaria*, **1**, 215.
— Hooper, C. W. (1916) *Amer. J. Physiol.* **40**, 544.
— Sperry, J. A. (1909) *Bull. Johns Hopk. Hosp.* **20**, 278.
Wiggers, C. J. (1918) *Amer. J. Physiol.* **36**, 314.
Williamson, C. S., Mann, F. L. (1923) *Ibid*, **65**, 267.
Wilson, W. C., MacGregor, A. R., Stewart, C. P. (1938) *Brit. J. Surg.* **25**, 826.

EPIDEMIC MYALGIA OR BORNHOLM DISEASE IN SOUTH INDIA

A REVIEW OF 19 CASES

H. J. HAMBURGER
M.D. Hamburg
MAJOR R.A.M.C.,
SURGICAL SPECIALIST

C. MCNEIL
M.B. Camb.
MAJOR R.A.M.C.,
GRADED PHYSICIAN

From the British Military Hospital, Bangalore, India Command

OUTBREAKS of epidemic myalgia or Bornholm disease arouse interest mainly because of the difficulties of the differential diagnosis. So far as we know, no outbreaks have been reported from tropical or subtropical countries except Alabama (Nichamin 1945) and a Caribbean island (McDaniel 1944).

Benign epidemic pleurisy (Williamson 1924) closely resembles it and has been observed by Scadding (1946) in the Middle East, and Roche and Smiddy (1946) in India. The latter paper, however, seems to deal more with an upper respiratory infection.

In twelve weeks, from the end of June to the end of September, there were 19 cases of a benign myalgic syndrome in a South India garrison, 14 of these cases occurring in one unit; 2 of the patients were Indian and 17 were Europeans. The clinical picture was in each case ill defined, but that of the series as a whole tallied very well with Sylvest's (1932) description of Bornholm disease. In all our cases the myalgia predominated, distinguishing them from the series observed by Scadding (1946) and Roche and Smiddy (1946). In fact, 5 out of 20 attacks observed were suspected of being acute abdominal emergencies, the myalgia giving the impression of rigidity; and 2 of the patients underwent exploratory laparotomy.

We wish to draw attention to the possibility of the occurrence of Bornholm disease in India, and the need to distinguish this malady from other acute upper abdominal or thoracic pains. Our findings are summarised in the accompanying table.

CLINICAL PICTURE

Onset was sudden, with severe pain in the lower part of the chest and/or upper abdomen.

Pain was aggravated by any movement of the affected muscles, such as deep breathing, coughing, pressing, or rotating the trunk. The patients repeatedly volunteered the information that laughing particularly exacerbated the pain; in one case the attack started during a fit of laughter. The centre of the pain was either in the upper epigastrium, radiating to the side, or in one hypochondrium. It lasted, on the average, 48 hours; if longer, it was interrupted by remissions of various lengths.

Temperature ranged between 100° and 102°F in about half the cases; in the other half it was normal. In the pyrexial cases, the temperature usually returned to normal with the disappearance of the pain. The pulse-rate was not raised in proportion to the temperature.

In practically all cases the affected muscles were tender. There were no other physical signs; no pleural friction was heard. There were no characteristic changes in the blood picture, except a suggestion of a mild relative lymphocytosis. In 15 cases examined radiologically, no abnormalities of the chest were detected.

ILLUSTRATIVE CASE-RECORDS

Case 5.—Acute onset of continuous stabbing pain in right lower chest and upper abdomen six hours before admission. Pain was aggravated by deep breathing.

On examination: temperature 98°F, pulse-rate 88, respirations 18. Chest movements diminished; percussion note

resonant; breath sounds normal, but poor air entry at both bases. Board-like rigidity of abdominal muscles. Maximal point of tenderness appeared to be a little below the xiphisternum. Patient looked toxic, with congested face. Radiography of the chest negative.

Exploratory laparotomy for a suspected perforated peptic ulcer showed no abnormality. Temperature settled within 48 hours, but it was difficult to assess the duration of the pain owing to the abdominal incision. White-cell count 7000 per c.mm. (polymorphs 86%). Convalescence uneventful.

Case 14.—Admitted with 24 hours' history of pain, of sudden onset, in left side of chest. This started while he was on a march, and was so severe that he had to fall out. He then went to bed, with a temperature of 100°F. In the morning he had a violent frontal headache and felt he could not take a deep breath.

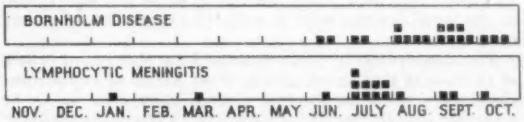
On examination: temperature 98°F, pulse-rate 70, respirations 20. Definite tenderness of muscles in 3rd–5th left intercostal spaces in anterior axillary line. Pectoral muscles tender on firm pressure. White-cell count 6800 per c.mm. (polymorphs 53%, lymphocytes 38%). Chest radiogram negative. Urinary chlorides normal.

Pain became gradually less severe, and patient was completely free of it five days after admission. He had been afebrile since admission.

COMMENTS

The outstanding clinical features of epidemic myalgia vary from outbreak to outbreak. As in Sylvest's (1932) description, upper epigastric and low chest pain, muscular tenderness, mild pyrexia of short duration, and embarrassment of breathing were prominent.

The importance of the differential diagnosis is shown by the fact that 5 cases simulated abdominal emergencies



Coincidence of outbreaks of Bornholm disease and of lymphocytic meningitis in South India.

so closely that 2 of them were operated on by different surgeons. It was the opinion of all the medical officers who examined these cases that they were indistinguishable from an early acute abdomen, and it is only in the context of the whole series of the cases that similar errors were avoided. It is perhaps helpful to note that the collapse of classical intestinal perforation was not present. Rather did our patients have a toxic look, with a congested face and drowsy appearance.

The tendency of the pain to shift from the centre to the side, and its relation to respiration, suggests pleurisy, appendicitis, cholecystitis, and amœbic or other hepatitis. We are, however, satisfied from clinical observation

Case no.	Pain		Pyrexia	Leucocyte-count			Tenderness of muscles	Remarks
	Site	Duration		Day	Total (per c.mm.)	Lymphocytes (%)		
1	Lower abdomen	5 hr.	Nil	..	..	..	+	Rigid abdomen; laparotomy performed; nil abnormal found
2	Right hypochondrium	72 hr.	Nil	3rd	5200	..	+	..
3	Right hypochondrium	24 hr.	100°F for 24 hr.	..	..	..	+	Rigidity +; suspected acute abdomen, but operation not performed
4	Right hypochondrium	48 hr.	101°F for 48 hr.	..	..	..	+	..
5	Right hypochondrium and epigastrium	48 hr.	Nil	2nd	7000	..	++	Rigidity +; laparotomy performed; nil abnormal discovered
6	Right hypochondrium and epigastrium	48 hr.	102°F for 48 hr.	1st	8000	36	..	Toxic, with congested face; suspected acute abdomen; first case suggesting myalgia
7	Right hypochondrium	72 hr.	Nil	8th	7400	35	++	..
8	Right hypochondrium	48 hr.	102°F for 48 hr.	1st	15,000	40	..	Toxic, with congested face
9	Right hypochondrium and epigastrium	48 hr.	101°F for 24 hr.	1st	15,000	36	+	..
10	Epigastrium	6 days	Nil	2nd	6600	..	+	Pain started after a route march; urinary chlorides normal; treated in outpatient department
11	Epigastrium	6 days	Nil	3rd	6800	..	+	Pain started after a route march; urinary chlorides normal; treated in outpatient department
12	Epigastrium and circumumbilical	10 hr.	Nil	..	..	..	+	Suspected acute abdomen
13	Right hypochondrium and circumumbilical	60 hr.	102°F for 48 hr.	1st	8200	..	+	Pain so severe as to require morphine on night of admission
14	Left chest	5 days	100°F for 24 hr.	2nd	6800	38	+	Urinary chlorides normal; Hb normal
15	Right and left chest, and upper abdomen	60 hr.	100°F for 24 hr.	3rd	7200	40	+	Urinary chlorides normal; Hb normal
16	Left chest and epigastrium	5 days	Nil	..	7200	36	+	Mild diarrhœa; urinary chlorides normal; Hb normal
17	Right chest and epigastrium	72 hr.	Nil	..	..	..	+	Urinary chlorides normal
18	Right hypochondrium	36 hr.	Nil	1st	5000	..	+	Relapsed after 5 days, becoming case 19
19	Left chest	48 hr.	101°F for 48 hr.	2nd	7000	..	+	Relapse of case 18
20	Right and left hypochondrium, and epigastrium	72 hr.	Nil	2nd	6800	..	+	..

and the invariably benign course that none of these conditions was present in any of our patients.

White-cell counts varied widely, as reported by other observers. No reduction in the hæmoglobin level was noted in the cases examined. The age and sex incidence, all cases being men below the age of 30, is not significant, as we were dealing with a military population of young men.

The description by Goldstone and Le Marquand (1946) of 13 cases in British soldiers in West Africa of a syndrome simulating acute abdominal disease seems to us to be a perfect description of an outbreak of Bornholm disease, except for one atypical case in which the pain was in the upper abdomen and back. Their contention that these cases (which like ours recovered spontaneously and rapidly) were abortive forms of perinephric staphylococcal infection does not appear to be supported by any objective findings. The benign clinical course of their cases (with the one exception) is to all intents and purposes identical with that in our series.

Huss (1934), Lindberg (1936), and Howard et al. (1943) have recorded an associated lymphocytic meningitis or meningo-encephalitis. None of our cases showed any neurological signs, but there have recently been several cases of benign lymphocytic meningitis in this area. The monthly incidence of lymphocytic meningitis and Bornholm disease is shown in the accompanying figure.

The climate in this station is subtropical. Naturally, the question arose if these muscular spasms could not be the result of sodium-chloride depletion. We therefore estimated the urinary chlorides in some cases but found no deficit, even in two patients in whom the attack had started immediately after long route marches.

In an epidemic in Mobile, Alabama, the prevailing climate being that of excessive rainfall with periods of continuously high humidity, warm moist weather was thought to be a precipitating factor (Nichamin 1945). The present cases all occurred during an unusually late and heavy monsoon with long periods of moist heat. One must, however, not forget that most epidemics have been observed in countries such as Denmark, Norway, and Iceland. Warm moist weather there and in South India are very different. We have convinced ourselves that the men in the most affected unit were not living under conditions of overcrowding, there being one room for every two soldiers.

In the Mobile epidemic the patients were left for an appreciable period with marked debility. This was not so in the present epidemic, as all the patients returned to full military duty immediately after discharge from hospital.

SUMMARY

A series of 19 cases of Bornholm disease or epidemic myalgia occurring in South India is reviewed.

In 2 cases the rigidity of abdominal muscles led to exploratory laparotomy.

We wish to thank Lieut.-Colonel C. Greenway, R.A.M.C., officer commanding this hospital, for his interest and permission to publish these cases, and Capt. E. A. Spriggs, R.A.M.C., graded physician, for his help in collecting the clinical data.

REFERENCES

Goldstone, B. W., Le Marquand, H. S. (1946) *Lancet*, ii, 267.

Howard, T., Weymuller, C. A., Edson, J., Ittner, E., Watson, J., Cassidy, M. L. (1943) *J. Amer. med. Ass.* **121**, 925.

Huss, R. (1934) *Bull. Off. int. Hyg. publ.* **26**, 1083.

Lindberg, G. (1936) *Acta pædiatr., Stockh.* **19**, 1.

McDaniel, W. S. (1944) *U.S. nav. med. Bull.* **43**, 664.

Nichamin, J. (1945) *J. Amer. med. Ass.* **129**, 600.

Roche, J., Smiddy, F. G. (1946) *Brit. med. J.* ii, 157.

Scadding, J. G. (1946) *Lancet*, i, 763.

Sylvest, E. (1932) *Bull. Off. int. Hyg. publ.* **24**, 1431.

Williamson, B. (1924) *Lancet*, ii, 64.

SYMPTOMS DUE TO MECKEL'S DIVERTICULUM

SELWYN TAYLOR

M.Ch. Oxfd, F.R.C.S.

ASSISTANT LECTURER IN SURGERY, POSTGRADUATE MEDICAL SCHOOL OF LONDON; LATELY SURGICAL REGISTRAR, KING'S COLLEGE HOSPITAL

THE discovery of a Meckel's diverticulum during a laparotomy must come as a surprise to most surgeons, for it is an uncommon congenital abnormality. Harkins (1933), who collected all those recorded where complete examination of the gastro-intestinal tract was made post mortem, found that in 25,149 necropsies it was present on 327 occasions—an incidence of 1·3%. Often the diverticulum is merely an incidental finding when the abdomen is opened for some quite different reason; rarely it is itself the site of disease, and on this account it is seldom if ever incriminated before operation. Among 69,000 admissions to the Truesdale Hospital Atwood (1946) has reported 37 cases with symptoms due to a Meckel's diverticulum. In the records of King's College Hospital there are numerous references to the finding of Meckel's diverticulum during abdominal operations, but only 11 times in eighteen years (1928–45) * was it the actual cause of symptoms which necessitated surgical intervention. Thirteen cases are briefly reviewed below, with the addition of one of different causation, as a result of which it is tentatively suggested that Meckel's diverticulum may be involved in the pathogenesis of chronic as well as acute abdominal pain.

Developmentally the vitelline duct communicates at an early stage between the yolk-sac and the midgut of the embryo. Normally it is obliterated from the umbilicus inwards, and therefore the intestinal end more often remains patent. It is this tube-like structure which is called Meckel's diverticulum and it may show any stage of involution, from complete patency between umbilicus and gut to a small sac ending in a fibrous cord attached to the anterior abdominal wall, or merely a free blind sac. Wilson (1942) classified the types as follows:

(1) Connexion between umbilicus and gut persists as a fibrous band or as an intestinal fistula.
(2) Umbilical portion of duct persists.
(3) Intestinal portion of duct persists.

Type 3 is the commonest finding and was the one first described by Meckel (1809, 1812).

ACUTE SYMPTOMS

In the accompanying table are collected the 11 cases of acute surgical conditions due to a Meckel's diverticulum.

The complications arising in connexion with Meckel's diverticulum are briefly as follows:

(1) Intestinal obstruction due to a band or to volvulus.
(2) Inflammation; perforation.
(3) Intussusception.
(4) Ulceration of heterotopic gastric mucosa; hæmorrhage indicated by melæna; perforation.
(5) Foreign body.
(6) Neoplasm.
(7) Aberrant pancreatic tissue.
(8) Strangulation in hernial sac (Littré's hernia).

1. *Intestinal obstruction* is the commonest complication and is either due to direct pressure on a loop of gut or to an actual volvulus (Rothman and Zetena 1943) caused by the rotation of gut round a diverticulum attached at its tip to the abdominal wall. Cases 2, 4, 7, and 11 in the table fall into this category, and the prognosis depends on how early the intestinal obstruction is treated.

* During the war years, however, there was not the usual admission of patients.

2. *Inflammation or diverticulitis* (sometimes progressing to perforation) simulates appendicitis so closely that the correct diagnosis is unlikely to be made. Rousseau and Martin (1943) reported the case of a girl, aged 15 years, who complained of pain in the right lower quadrant of the abdomen. There were four attacks of pain in six months, each lasting six hours and being preceded by nausea and followed by vomiting. The surgeon was not satisfied with the diagnosis of appendicitis and, after the acute symptoms had subsided, a barium examination was done, with the result that a four-hour film showed a pear-shaped sac in the terminal ileum; the appendix did not fill. This shows that in favourable circumstances a Meckel's diverticulum may be demonstrated radiologically, which may be important in the diagnosis of abdominal pain (see below).

3. *Intussusception* is a particularly lethal complication of Meckel's diverticulum. It occurred twice in this series but is not common. Of Atwood's (1946) series of 37 cases of Meckel's diverticulum only 1 developed an intussusception through inversion of the diverticulum. Harkins (1933), reviewing the cases published earlier, found only 160, and added 2 more. He pointed out that intussusception due to an invaginated Meckel's diverticulum differed from the ordinary intussusception in four ways: it occurred in older children; there was usually a history of a previous attack; the progress was more chronic and more mild; and vomiting was usually more intense.

4. *Ulceration of heterotopic gastric mucosa* (hæmorrhage indicated by melæna) is an interesting finding in the diverticulum. There was 1 case of this in the present series, and the leiomyoma in case 10 may well have arisen in ectopic gastric tissue, but this could not be demonstrated after the widespread secondary changes had taken place. Marshall (1942), reviewing 12 consecutive cases of diseased diverticula, propounded the view that this was the commonest complication in the younger patient, whereas the older age-group tended to develop intestinal obstruction or inflammatory lesions. Aschner and Karelitz (1930) discussed the condition, mentioning 21 previously recorded cases of Meckel's diverticulum containing gastric mucosa, in 12 of which ulceration had taken place. They added 2 cases of their own in which bleeding from the bowel was the presenting sign. Mr. Rupert Corbett has kindly sent me particulars of 2 further cases of bleeding from Meckel's diverticulum. Since a correct preoperative diagnosis was made, a brief case-record of each is given here.

Case 12.—A boy, aged 2 years, was admitted to St. Bartholomew's Hospital on Feb. 16, 1942, having passed blood in his motions. The mother had noticed bright blood in a loose motion three weeks previously. The child appeared well otherwise, with no vomiting or pain. Thereafter he passed a dark stool daily, started to go off his food, and complained of lassitude. Three days before admission he started to improve and passed more normal motions.

Examination.—The child was well built but pale and irritable. Abdomen, nothing abnormal discovered; sigmoidoscopy normal. Temperature went up to 100°F and pulse-rate varied from 100 to 120. Hæmoglobin 34%, falling later to 29%; next month it rose to 58%. No pathogenic organisms isolated from stools. Heterotopic gastric mucosa in a Meckel's diverticulum was suspected, but the mother did not agree to operation.

The patient returned on May 23, 1942, with recurrent hæmorrhage; his health had deteriorated; Hb 47%, pulse-rate 120, temperature normal.

Operation.—On May 27 a laparotomy was performed, and a large Meckel's diverticulum situated 9 in. from the ileo-cæcal valve was removed. The specimen was sectioned by Dr. Cuthbert Dukes, who found large numbers of gastric glands with both pepsin-secreting and acid-secreting cells. There was a small nodule of tissue resembling pancreas. The specimen was presented to the Royal College of Surgeons.

Case 13.—A male, aged 19, was admitted to hospital on Aug. 20, 1941, passing black motions. In 1930 he had fallen off a wall, and two days later had passed black motions for a fortnight. Diagnosed as traumatic intestinal hæmorrhage at St. Bartholomew's Hospital. Six months later he had had a shorter attack after eating crackling on roast pork. In 1938 he had again been investigated for abdominal pain and dark motions. Since then he had suffered three or four attacks of melæna a year.

Examination.—Pale, nothing abnormal found. Sigmoidoscopy, barium examination, and gastroscopy all normal.

Operation on Sept. 20, 1941, revealed a small Meckel's diverticulum 2 ft. from the ileocæcal valve and adherent to the mesentery with several enlarged lymphatic glands nearby. Section of the diverticulum by Dr. Dukes showed heterotopic gastric mucosa with ulceration.

Follow-up.—Seen on Aug. 25, 1942, patient was very fit and serving in Royal Air Force.

ACUTE SURGICAL CONDITIONS DUE TO MECKEL'S DIVERTICULUM

Case no.	Sex	Age (yrs.)	Clinical findings on admission	Provisional diagnosis	Operative findings	Result
1	M	31	Acute abdominal pain; nausea, vomiting; tenderness not localised	Appendicitis	Gangrenous M.D.	Recovery
2	M	11	Abdominal pain; tympanites; absolute constipation 3 days	Intestinal obstruction	M.D. twisted round and obstructing gut	Death
3	M	4	Abdominal pain 48 hr.; vomiting; mass in right side; blood and mucus present per rectum	Intussusception	Intussusception with M.D. at tip	Death
4	M	64	Abdominal pain; vomiting for days	Intestinal obstruction	Small intestine obstructed by M.D. attached to anterior abdominal wall	Recovery
5	M	10	Abdominal pain few hours; vomiting; shock; mucus only per rectum	Intussusception	Intussusception with M.D. at tip	Recovery
6	F	36	Abdominal pain 24 hr.; no vomiting; 2 months pregnant; tender right iliac fossa	Appendicitis	Inflamed M.D.	Recovery
7	M	23	Abdominal pain 3 days; vomited continuously; hiccups; ileus	Intestinal obstruction	Small intestine obstructed by M.D.	Death
8	M	6	Abdominal pain 2 days; no vomiting; tender in right side of epigastrium	Appendicitis	M.D. with peptic ulcer at tip; subacutely inflamed appendix	Recovery
9	M	44	Abdominal pain; no vomiting; tender in both iliac fossæ	Appendicitis	Inflamed M.D. containing gastric mucosa; subacutely inflamed appendix containing 2 carcinoid tumours	Recovery
10	M	30	Recurrent attacks of severe melæna; two blood-transfusions; barium enema showed no abnormality	Duodenal ulcer	Leiomyoma of M.D. adherent to another loop of ileum	Recovery
11	M	73	Acute pain around femoral canal; constipation	Strangulated hernia	Littré's hernia with gangrenous diverticulum	Recovery

M.D. = Meckel's diverticulum.

Sir Gordon Gordon-Taylor also informs me that he has had 1 case of bleeding from an ulcerated Meckel's diverticulum. Schullinger and Stout (1934), reviewing this complication in the light of 68 previously recorded cases, wrote: "Sudden severe pain in the lower abdomen with rigidity, signs of diffusing peritonitis, fever and leucocytosis, especially in children should lead to suspicion of Meckel's diverticulum. Cryptic intestinal bleeding should make one suspect Meckel's diverticulum as a possible source."

5. A *foreign body* is occasionally met with in an inflamed Meckel's diverticulum, and has probably the same significance as a foreign body in the inflamed appendix. Case 6 presented an acutely inflamed diverticulum which on being cut open was found to contain a rolled portion of tomato skin.

6. *Neoplasm* is a rare complication, but 1 is recorded in this series. The leiomyoma reported here had caused repeated melæna, which on more than one occasion had necessitated blood-transfusion, a bleeding duodenal ulcer being suspected. The patient was admitted with Hb 32% and required four pints of blood before laparotomy could be undertaken. The tumour was well encapsulated and very vascular, but with no evidence of malignancy. This patient replied to an inquiry on Oct. 21, 1946, that he was fit and well, weighed 12 st., and had suffered no further attacks of bleeding.

7. *Aberrant pancreatic tissue* occurs in many sites in the abdomen, but Hunt and Bonesteel (1934) could find only 13 recorded cases in which it had been demonstrated in Meckel's diverticulum. They added a 14th case in which the presenting symptom was acute lower abdominal pain unassociated with vomiting, tenderness, or rigidity. It is interesting to speculate whether the pancreatitis seen in these cases is primary or secondary to an inflammation of the diverticulum; possibly such tissue could be involved in mumps.

CHRONIC SYMPTOMS

All the above complications manifest themselves in some form of acute abdomen, and I have found no record of a Meckel's diverticulum causing chronic or subacute abdominal symptoms. This is all the more surprising when it is remembered that any diverticulum of a hollow viscus is a potential source of pain if it is distended. Spriggs and Marxer (1925–26), in their comprehensive review of intestinal diverticula, state that duodenal and jejunal diverticula may give rise to definite and sometimes distressing symptoms. "The cause of the symptoms is probably mainly stretching of the walls of the pouch by distension with food or irritation by either acid or putrefying material." It is remarkable therefore that the most constantly present diverticulum of the small intestine (Edwards 1939) should not have been described as producing symptoms similar to a diverticulum of the duodenum or jejunum. The following case illustrates the type of clinical picture which may be presented:

Case 14.—A leading seaman, aged 27, reported to a Naval sick-bay complaining of pain in the lower abdomen which had troubled him intermittently for six months. He pointed to a spot three finger-breadths above the symphysis pubis as the site of the pain and said that it was occasionally severe enough to wake him at night.

Examination.—He was a well-built man with tongue clean and moist and abdomen moving normally on respiration. On palpation a vague swelling could be made out just to the right of and below the umbilicus, and on firm pressure the pain could be reproduced. There was no hernia; patient had never vomited during an attack and did not have constipation or difficulty of micturition. Urine: sp. gr. 1·016; acid reaction; no albumin, sugar, or ketones present. Blood-count: red cells 4,810,000; Hb 104%; colour-index 1·08; white cells 6400 per c.mm. (polymorphs 66%, lymphocytes 29%, monocytes 3%, eosinophils 2%). Wassermann and Meinicke reactions negative.

Straight radiography of the abdomen revealed no abnormality. At barium-meal examination the stomach and duodenum were seen to have normal outlines; no evidence of diverticulum was detected; the meal passed normally through the intestine.

Operation.—As the patient continued to have intermittent attacks of pain and discomfort, it was decided to perform a laparotomy, the provisional diagnosis being a mesenteric cyst. The abdomen was opened; there was no excess of free fluid, the appendix appeared healthy, and there were no adhesions. The stomach and duodenum appeared normal, and no diverticulum of the latter was present; pancreas normal on palpation; no evidence of a mesenteric cyst. A tubular Meckel's diverticulum, with engorged vessels coursing over its apex, was discovered about a foot from the ileocæcal junction; and, as this would lie naturally in approximately the position at which the patient complained of his pain, it was decided to remove it. A crushing clamp was placed across its base, and it was excised; the ileum was narrow at this point and, as the removal of the diverticulum decreased its breadth even further, a side-to-side anastomosis was performed to ensure that stenosis was not produced. The appendix was removed and the abdomen closed.

Progress.—Convalescence was uneventful. Eighteen days after operation he was discharged from hospital with a soundly healed wound and complete relief from his previous pain and discomfort.

A month later he was having some trouble with flatulence, but four months later he was completely free from his old complaints.

Pathologist's Report (Dr. W. W. Woods).—"Meckel's diverticulum; no gastric mucosa; no pathological change. A bell-shaped piece of intestine and thus a characteristic Meckel's diverticulum. It has been turned inside out and fixed in this position. It measures about 1·5 cm. in diameter. The mucosa looks normal, being grey, velvety, and thrown up into ridges. No sign of a different sort of mucosa in any part. No congestion. No ulceration. Serosa is partly grey, partly dull red. Wall not thickened; mucosa, submucosa, and muscularis are each about 0·05 cm. thick.

"The diverticulum has the structure of normal intestine. Its villous mucosa is everywhere the same. There is no gastric mucosa. The occasional epithelial cells with eosinophilous cytoplasm in the deeper glands are the normal cells. Apart from the normal areas of lymphoid tissue, the connective tissue of the mucosa contains eosinophil leucocytes, lymphocytes, and plasmacytoid cells, but they do not appear to be in greater numbers than are found in normal intestinal mucosa. The moderate degree of congestion of submucosa and subserosa and the few focal hæmorrhages occurred during the operation. Thus there is no inflammation, nor strangulation, nor any other pathological change."

A thorough investigation of this patient was made before and during operation, and it could reasonably be claimed that most of the other causes for these attacks of abdominal pain had been eliminated. After excision of the diverticulum the patient was completely relieved of his symptoms; hence it appears very probable that his attacks of pain were due to intermittent distension of his diverticulum, its inability to empty, or narrowing of the small intestine at this point. The narrowing or "coarctation" of the ileum opposite the diverticulum may have been responsible for its inability to empty properly. It might have been wise to resect the segment of intestine rather than amputate the diverticulum and then short-circuit the coarctation as was done in this case.

This is only a single case-record, but it suggests that if the possibility of such a condition were kept in mind others might be found. It provides yet another good reason for looking for a Meckel's diverticulum when every appendicectomy is performed, and it is precisely in those patients with a not too clear-cut clinical picture of appendicitis that the condition is most likely to be encountered. Though the diverticulum was not shown at barium examination in this case, it is sometimes possible to show its presence, as in Rousseau and Martin's (1943) patient. I do not agree with Greenblatt et al. (1936) that all Meckel's diverticula encountered at laparotomy should be removed as a routine.

An analysis of the last 11 cases of acute abdomen in which a Meckel's diverticulum was the causal factor admitted to the hospital shows examples of practically every known complication, and confirms the opinion of previous writers on the subject that the correct diagnosis is rarely made before operation.

The commonest situation for this developmental error is 18 in. from the ileocæcal valve, but it has often been discovered 12–36 in. from the end of the ileum; therefore, unless the whole terminal 3 ft. of ileum is inspected, it may be overlooked.

SUMMARY

Meckel's diverticulum occurs in 1·3% of people and is found in the ileum 18–36 in. from the ileocæcal valve.

Acute abdominal symptoms are caused by the diverticulum, and the pathogenesis of these has been investigated in 11 consecutive cases. Two additional cases presenting melæna are described.

Subacute or chronic abdominal symptoms were caused by the diverticulum in 1 case and its mechanism is discussed.

Meckel's diverticulum should be looked for more often and more carefully, especially in laparotomies where the other abdominal organs do not appear sufficiently abnormal to explain the signs and symptoms.

It is a pleasure to acknowledge the assistance given by Sir Gordon Gordon-Taylor and Mr. Rupert Corbett in providing information about their cases, to Dr. W. W. Woods for the pathological report, and not least to Miss D. A. Fern, chief clerk of the record department, King's College Hospital.

REFERENCES

Aschner, P. W., Karelitz, S. (1930) *Ann. Surg.* **91**, 573.
Atwood, W. G. (1946) *New Engl. J. Med.* **234**, 329.
Edwards, H. C. (1939) Diverticula and Diverticulitis of the Intestine, Bristol.
Greenblatt, R. B., Pund, E. R., Bernard, G. T. (1936) *Amer. J. Surg.* **31**, 285.
Harkins, H. N. (1933) *Ann. Surg.* **98**, 1070.
Hunt, V. C., Bonesteel, H. T. S. (1934) *Arch. Surg., Chicago*, **28**, 425.
Marshall, J. F. (1942) *N.C. med. J.* **3**, 192.
Meckel, J. F. (1809) *Arch. Physiol.* **9**, 421.
— (1812) Handbuch der Pathologischen Anatomie, Leipzig, vol. 1, p. 553.
Rothman, M., Zotena, D. F. (1943) *Amer. J. Surg.* **60**, 443.
Rousseau, J. P., Martin, A. G. M. (1943) *Radiology*, **40**, 605.
Schullinger, R. N., Stout, A. P. (1934) *Arch. Surg., Chicago*, **28**, 440.
Spriggs, E. I., Marxer, O. A. (1925–26) *Quart. J. Med.* **19**, 1.
Wilson, H. (1942) *Amer. J. Surg.* **56**, 614.

DETERMINATION OF HÆMOGLOBIN

II. THE HALDANE HÆMOGLOBIN STANDARD

COMPARED WITH IRON AND GASOMETRIC ESTIMATIONS

E. J. KING M. GILCHRIST I. D. P. WOOTTON
Postgraduate Medical School of London

R. DONALDSON R. B. SISSON
National Physical Laboratory, Teddington

R. G. MACFARLANE H. M. JOPE J. R. P. O'BRIEN
Radcliffe Infirmary, Oxford

J. M. PETERSON D. H. STRANGEWAYS
University of Wales, Cardiff

THE Haldane-Gowers method for estimating hæmoglobin has been widely used in this country for many years in determining normal English hæmatological values and assessing nutrition. It is therefore desirable that the results obtained by this method should be capable of comparison with the results of other methods in other countries, but before this can be achieved it is necessary to be certain what the Haldane standard represents in terms of hæmoglobin.

The solution of carboxyhæmoglobin which Haldane (1901) adopted as a standard was equal in colour to a 1% dilution of blood which had an oxygen capacity of 18·5 ml. of oxygen/100 ml. as estimated by the Haldane gasometric method. The application of Hüffner's (1894) factor (1 g. of Hb = 1·34 ml. of O_2) converts 18·5 ml. of oxygen to 13·8 g. of hæmoglobin (Hb). Hence it has been generally accepted that 100% on the Haldane scale is equivalent to 13·8 g. of Hb/100 ml.

More recently the method of standardisation has been altered, colour tubes being defined in terms of colour, and only indirectly in terms of oxygen capacity.

B.S.I. COLOUR STANDARDISATION

The standardisation of the Haldane Hb method—British Standard 1079 (1942) (Donaldson et al. 1943)—was undertaken to remove as far as possible the non-personal error in the Haldane hæmoglobinometer. In the British Standards Institution (B.S.I.) specification, limits of accuracy were set for each part of the apparatus—colour tube, dilution tube, and pipette. The limits were chosen to be acceptable to both user and manufacturer: sufficiently narrow not to add appreciably to the experimental error, and wide enough to allow economic production by the manufacturer. For the colour tube a colour definition was adopted. The optical absorption of the completed tube was specified rather than the chemical properties of the Hb solution. This course was taken because the primary function of the colour tube is to act as a colour standard, and because colour can be measured as accurately as oxygen or iron. There also follows the advantage that a colour tube can be tested at the last stage of manufacture and at any time in the course of its life.

The maintenance of the colour standard at the National Physical Laboratory (N.P.L.) has now been going on for about five years. On the whole, the methods of colour specification adopted in British Standard 1079 have been found satisfactory in practice. It has been possible to make calibrated colour tubes generally available at reasonable cost. With the present steady improvement in colour-measuring apparatus, both visual and photo-electric, an accuracy corresponding to $\pm^1/_2$% in Hb concentration can be realised both in the maintenance of the standard and in the routine testing of the tubes for distribution. The unexpected permanence of the colour tubes also helped considerably to reduce the work connected with maintenance. These tubes have the reputation of sometimes fading badly, and certainly we have come across some examples of discoloured tubes of older manufacture; but, since the standardisation, none from the current commercial production has been found to fade in this way. In the course of the colour-tube testing at the N.P.L. some 20 tubes have been measured and subsequently remeasured after being in use for an average interval of about 2 years. The average rate of change is 0·2% per year. This performance compares very favourably with that of other colour standards, such as dyed gelatin filters or even some coloured glasses.

OXYGEN AND IRON EQUIVALENT

In the preparation of the colour standard, the oxygen content of a sample of blood was determined by the Haldane blood-gas apparatus, and its colour after conversion into carboxyhæmoglobin was estimated by a photo-electric spectrophotometer. The colour corresponding to an oxygen capacity of 18·5 ml./100 ml. of blood was then standardised. This method of defining the standard followed the usual practice for making colour tubes; and comparisons with some older tubes, notably one belonging to Dr. C. Price-Jones with which he carried out work on hæmatological standards, afforded confirmatory evidence that the new standard was in agreement with Haldane's original definition.

For some time, however, evidence has been accumulating which suggests that this standard colour represents more than 13·8 g. of Hb. Surveys of the values of normal English males in which an equivalent standard was used—e.g., Price-Jones et al. 1935—gave significantly lower results than those in which other methods for estimating

TABLE I—SCHEME OF INVESTIGATIONS CARRIED OUT DURING TWO SESSIONS AT DIFFERENT CENTRES

Session	Year	No. of samples	Donors	Investigations at: P.M.S.L.	Cardiff	Oxford	N.P.L.
1	1945	11	Normal adult males	Fe analysis O_2 capacity	O_2 capacity	Fe analysis O_2 capacity CO capacity	Spectrophotometer, colour comparator
2	1946	10	Normal adult females	Fe analysis O_2 capacity CO capacity	O_2 capacity	..	Spectrophotometer, colour comparator

Hb were used—e.g., Jenkins and Don (1933)—and normal figures from the U.S.A. and other parts of the world agreed more closely with the latter observations (Wintrobe 1942).

It was also observed independently by two of us (E. J. K. and R. G. M.) that estimations by the Haldane method and by photo-electric methods standardised by iron determination suggested that commercial Haldane standards, at any rate, represented more Hb than supposed.

These results suggested that there was need for a more authoritative determination of the Hb equivalent of the standard. The 1942 standardisation experiment was designed on too narrow a basis (one blood only) to give a generally valid relation between oxygen and colour. Its primary purpose was not to establish this relation but to transfer the fundamental definition from oxygen to colour. All that was required, therefore, was that it should be more accurate than the commercial methods for producing colour tubes, which it undoubtedly was. When the colour definition and a technique for the production of accurately calibrated tubes had been established, the task of linking colour with oxygen and iron could be undertaken more advantageously.

Macfarlane and O'Brien (1944) and King et al. (1944) carried out an extensive determination of this relationship with 49 and 20 bloods respectively. The result was that the B.S.I. standard was found to be equivalent to 14·7 g. of Hb on an oxygen basis, and 14·8 g. of Hb on an iron basis. This difference from 13·8 g. was considered too large to be explained on the grounds of experimental error, though no adequate explanation for the discrepancy was offered.

In these latter experiments the colour was determined by the usual hæmoglobinometer colour tube and dilution tube. Macfarlane (1945) has shown that with some observers the personal error in colour matching far exceeds the calibration errors, and that the colour measurement was probably for this reason more unreliable than the oxygen or iron estimations. Following a suggestion put forward by him, the work has been repeated with the substitution of the N.P.L. colour-measuring equipment for the Haldane Hb method.

TABLE II—COMPARISON OF HÆMOGLOBIN CONTENTS OF 21 NORMAL BLOODS DERIVED FROM IRON AND GASOMETRIC DETERMINATIONS WITH THE HALDANE VALUES AS MEASURED IN COLOUR COMPARATOR

Blood	Hb value of blood on Haldane scale	Hæmoglobin (g.) corresponding to 100% Haldane: By iron analysis P.M.S.L.	By iron analysis Oxford	By gas analysis: Oxygen P.M.S.L.	Oxygen Cardiff	Oxygen Oxford	Carbon monoxide Oxford: Without prelim. reduction	Carbon monoxide Oxford: After reduction
Male:								
1	103·1	14·85	14·78	14·39	..	..	14·66	14·84
2	108·4	15·12	15·11	14·63	..	14·76	15·02	15·16
3	105·6	14·83	15·05	14·50	..	14·51	14·67	15·13
4	104·8	14·91	14·80	14·30	14·31	14·29	14·61	15·03
5	102·3	15·01	14·85	14·59	14·74	14·55	14·69	15·14
6	108·9	14·83	14·89	14·21	14·45	14·30	14·49	14·95
7	115·6	14·92	14·87	14·42	14·45	14·55	14·68	14·88
8	111·7	14·97	14·83	14·53	14·69	14·75	14·70	14·90
9	105·2	14·72	14·52	14·43	14·33	14·20	14·39	14·53
10	99·8	15·01	14·62	14·57	14·43	14·58	14·58	14·84
11	113·9	15·03	11·62	14·52	14·48	14·34	14·74	15·00
Mean	..	14·93	14·81	14·46	14·49	14·48	14·66	14·95
σ	..	0·12	0·17	0·12	0·15	0·18	0·15	0·17
Female:							P.M.S.L.	
1	109·6	14·64	..	14·07	14·14	..	13·86	14·46
2	93·7	14·92	..	14·35	14·78	..	14·07	14·75
3	88·9	14·54	..	14·03	14·30	..	14·33	14·67
4	92·4	14·60	..	13·95	14·06	..	14·00	14·02
5	83·9	14·82	..	14·50	14·65	..	14·62	14·61
6	88·2	14·67	..	14·48	14·56	..	14·34	14·43
7	83·6	14·70	..	14·40	14·62	..	14·49	14·65
8	79·8	14·80	..	14·45	14·75	..	14·54	14·66
9	93·1	14·82	..	14·33	14·64	..	14·35	14·49
10	91·3	14·93	..	14·46	14·53	..	14·38	14·44
Mean	..	14·74	..	14·30	14·50	..	14·30	14·52
σ	..	0·13	..	0·21	0·25	..	0·25	0·21

TABLE III—HÆMOGLOBIN EQUIVALENT OF B.S.I. STANDARD

—	Hæmoglobin (g.) corresponding to 100% Haldane: By iron analysis (P.M.S.L.) Spectrophotometer	By iron analysis (P.M.S.L.) Comparator (from table II)	By oxygen analysis (P.M.S.L. and Cardiff) Spectrophotometer	By oxygen analysis (P.M.S.L. and Cardiff) Comparator (from table II)
Male ..	14·77	14·93	14·33	14·47
Female	14·74	14·74	14·40	14·40
Mean ..	14·75	14·84	14·37	14·44
	Final mean 14·80		Final mean 14·41	

The arrangements of this redetermination and its results are described below.

EXPERIMENTAL

General Organisation.—The work was carried out during a large-scale investigation into the accuracy of different methods of Hb determination, conducted simultaneously at the Postgraduate Medical School of London, the University of Cardiff, the Radcliffe Infirmary, Oxford, and the National Physical Laboratory. Venous blood was withdrawn from subjects at Oxford, and samples were distributed by post to the other centres, considerable care being taken to make sure that the samples were truly representative of the original blood. Simultaneous determinations at the various centres were then carried out; these usually began within 24 hours of taking the blood. Generally one or two samples of blood were dealt with during each week of an experimental session. Further details are given in table I.

Briefly, iron was determined by titration with titanous chloride (Delory 1943); oxygen capacity was determined according to the method of Van Slyke and Neill (1924); and carbon monoxide capacity, both before and after preliminary reduction, was measured.

Preparation of Solutions.—Solutions of as many as six different Hb derivatives were prepared. For the present purpose, however, solutions of carboxyhæmoglobin were prepared as follows:

With calibrated pipettes and volumetric flasks, dilutions of the blood sample (1·0% and 0·5%) were made with 0·04% ammonia.

The solutions were then placed in conical flasks and thoroughly gassed with the commercial coal-gas supply, since preliminary experiments had shown that commercial coal-gas (tested in parallel with pure carbon monoxide) did not introduce an appreciable error.

After being gassed, the solutions were preserved in stoppered bottles; if a delay of more than an hour elapsed between the preparation and colour measurements, the solutions were regassed immediately before the measurements were made.

RESULTS

For each blood sample the following determinations were obtained:

(1) The iron content in mg. of Fe/100 ml. of blood.

(2) The oxygen capacity in ml. of O_2/100 ml. of blood, and the carbon-monoxide combining power, both before and after reduction, in ml. of CO/100 ml. of blood.

These figures were then converted into g. of Hb/100 ml. blood with the conversion factors given by Hüffner (1894)—i.e., Hb contains 0·334% of Fe, and 1 g. of Hb = 1·34 ml. of O_2 or of CO.

(3) The colour as a percentage of the Haldane standard tube, obtained by comparison of the carboxyhæmoglobin solutions with the N.P.L. standards, using a colour comparator and a spectrophotometer.

From (1), (2), and (3), values were calculated of the concentration of Hb in g./100 ml. of blood, corresponding to 100% on the Haldane scale.

In table II are shown the iron and oxygen equivalents of the B.S.I. standard for each blood.

The colour was also determined on the spectrophotometer by complete absorption curves throughout the spectrum for each blood. The mean curve for the males and females is shown in the accompanying figure, which includes a comparison with other measurements by Kennedy (1927), Newcomer (1919), Haurowitz (1926), Heilmeyer (1932), Race (1940), and Jope et al. (1943).

From an absorption curve the value on the Haldane scale can be derived by calculation. This can be done by using the absorption at one wave-length only, but in this instance a method of calculation which gives an over-all result for the complete range of wave-lengths was used. The calculations are long and were only carried out for the means of the male and female groups. The results are shown in table III.

The oxygen and iron analyses at Oxford have been omitted from calculation of the final means, since these analyses were only carried out for the first group of male bloods.

The results as measured by spectrophotometer and comparator are in good agreement, and the average for the two instruments has been taken for the final results.

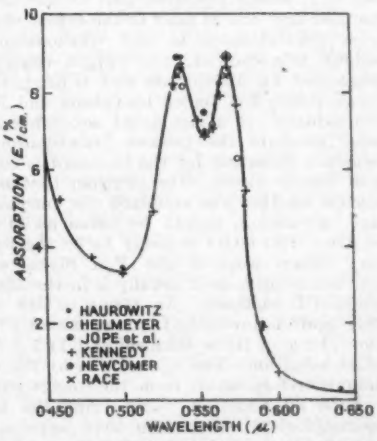
Male–Female Difference.—There is no evidence of any systematic difference between the male and female values. The comparator showed a difference of about 1%, but this was not confirmed by the spectrophotometer.

TABLE IV—NORMAL HÆMATOLOGICAL VALUES (MALES)

Observer	Hb (g./100 ml.)	Red cells (million/c.mm.)	P.C.V. (%)	M.C.V. (c.μ)	M.C.H. (μμg.)	M.C.H.C. (%)	Remarks
Price-Jones, Vaughan, and Goddard (England) 1935	14·6	5·42	46·8	85·9	26·9	31·3	Assuming 100% Hb = 13·8 g. per 100 ml.
	15·6	5·42	46·8	85·9	28·8	33·5	Assuming 100% Hb = 14·8 g. per 100 ml.
Macfarlane and O'Brien (England) 1944	16·2	5·51	47·0	85·3	28·8	33·6	Hb by direct iron estimation
King et al. (England) 1944	16·0	..	..	..	..	..	Hb by direct iron estimation
Wintrobe (U.S.A.) 1942	16·0	5·4	47·0	87·0	29·0	34·0	Composite "normal" figures for men

DISCUSSION

From the foregoing results it now seems to be established that the B.S.I. Haldane-Gowers Hb standard is equivalent to significantly more Hb than was originally supposed. If iron determination is accepted as the most reliable method for estimating Hb, the standard is equivalent to 14·8 g. of Hb. This result, obtained on 21 blood samples by independent determinations in two different laboratories, agrees almost exactly with the previous results of Macfarlane and O'Brien (1944) on 49 samples, and of King et al. (1944) on 20 samples. In the present investigation the colorimetric determinations which form the essential link between the B.S.I. standard and the iron determinations were made with the most precise instruments available in this country, and not, as in the previous work, with the Haldane hæmoglobinometer.



Absorption curve of carboxyhæmoglobin. Optical density of a 1 cm. layer of a solution containing 1 g. of Hb per 100 ml. Hb was determined by iron analysis (1 g. of Hb contains 3·34 mg. of Fe).

The oxygen-capacity determinations agree less closely with the previous work. Macfarlane and O'Brien (1944) obtained, on the basis of oxygen capacity, an equivalent value for the standard of 14·7 g. Thus the iron and oxygen determinations were in good theoretical agreement. It is true that there was a good deal of variation in the iron/oxygen relationship from one blood sample to another, and from one group of subjects to another. This variation was thought to be due to technical errors, changes in technical ability or procedure during the work, and, possibly, to a sex-difference in the relationship of iron to oxygen capacity.

In the present series, however, the oxygen-capacity determinations, made by the same method but in three different laboratories, agree fairly closely to the mean figure of 14·4 g. of Hb as the equivalent of the standard. Thus there are two discrepancies to explain: (1) the difference of 0·4 g. (or 2·7%) between 14·8 g. as determined by iron estimation and 14·4 g. as determined by oxygen capacity in the present series; and (2) the difference of 0·3 g. (2%) between the present equivalent determined by oxygen capacity and that of Macfarlane and O'Brien (1944).

It must be admitted that neither the iron nor the gasometric method is absolutely accurate. Variations in technique, in reagents, and in apparatus may, in either case, lead not only to variation between results but also to consistent errors that may affect the mean of a series of results. Such errors may explain part of the observed discrepancy between iron and oxygen figures in the present series. Part of the difference may well be due to the presence of inactive Hb in certain blood samples, which would therefore give a low oxygen capacity per unit of Hb iron. It may be significant in this respect that the CO capacity estimated after reduction of the Hb sample is very close to the theoretical figure for the oxygen/iron ratio (preliminary reduction converts any inactive Hb into a form which is capable of combining with carbon monoxide).

As regards the oxygen-capacity estimations of Macfarlane and O'Brien (1944) the reason for the difference from the present figure is not clear. It seems unlikely that the latter, derived from three independent sources in good agreement, is at fault. It is also unlikely that

the normal blood samples examined in the 1944 series differed qualitatively from the present series to a degree likely to explain the difference. It must be assumed that, for some unknown reason, the previous oxygen-capacity determinations were too high, or the iron results too low. Since the iron results agree well both with those of King et al. (1944) and those of the present series, it seems probable that it was the 1944 oxygen method that was at fault to the extent of 2%.

A sex-difference in the relationship between the colour, iron content, and oxygen capacity of Hb was suggested by Macfarlane and O'Brien (1944) and Bell et al. (1945) but denied by Gibson and Harrison (1946). No evidence of a significant sex-difference of this sort was found in the present investigations; hence no separate definition for the standard is required for male and female blood. The problem that now arises is to decide whether the standard, for purposes of reference and calculation, should be taken as 14·8 g. or 14·4 g. of Hb. The latter is likely to be the figure derived in any future work if the Van Slyke oxygen-capacity method is used, as it usually is in the standardisation of other Hb methods. In terms of Hb mass, however, this figure is probably too low, since by iron determination 14·8 g. of Hb is obtained and 14·7 g. by CO capacity after reduction. The figure given by the iron determination, therefore, seems to be the correct one to adopt.

Such an adoption would bring the normal English hæmatological values into close agreement with those accepted in the U.S.A. Table IV shows the figures obtained by Price-Jones et al. (1935), in which they assumed that 100% of their standard was equivalent to 13·8 g. of Hb. Since it has been found that this standard has very nearly the same value as the B.S.I. standard, it is permissible to recalculate these normal values, assuming that the standard actually represented 14·8 g. When this is done, the results become very similar to those given by Wintrobe (1942) as representative of the U.S.A.

The mean figures given for red-cell count, and mean corpuscular volume for normal males, both in England and the U.S.A., are almost identical; hence the supposed difference in Hb content has always been difficult to explain. It is true that the English standard in these recalculations is based on iron, whereas most American figures are based on oxygen capacity, which may be relatively lower. Against this, however, must be set the fact that the English surveys have used the Haldane-Gowers Hb method, and it has been shown (Macfarlane 1945) that even the most experienced observers read, on the average, 4% too low by this method, a tendency that would more than compensate any difference between iron and oxygen standardisation.

As regards the difference of 4·4% between Haldane's original definition of his standard and the present value, it is probable that it can be explained almost entirely by the lower results given by the Haldane gasometric method as compared with the modern Van Slyke apparatus. Bierring et al. (1936) found a mean difference in the results of the two methods of 1·2 volumes %, an even greater difference than exists between the two definitions.

SUMMARY

The hæmoglobin values of 21 normal bloods have been measured by iron analyses and gasometric determinations carried out simultaneously at several centres. By means of the N.P.L. colour comparator and a photo-electric spectrophotometer, the hæmoglobin contents of these bloods have also been measured on the Haldane-Gowers scale.

The B.S.I. standard tube (100% Haldane) is not equivalent to 13·8 g. of hæmoglobin per 100 ml. of blood but to 14·8 g. when measured by iron analysis, or 14·4 g. when measured by oxygen capacity. The reasons for this discrepancy are discussed.

Normal English hæmatological values, when recalculated with the new value for 100% Haldane, come into line with those published in other countries, notably the United States.

This investigation has been carried out for the Medical Research Council's subcommittee on analytical methods. The expenses incurred were partly defrayed by a grant from the Medical Research Council, to whom grateful acknowledgment is made.

Our thanks are due to Dr. C. R. Harington, chairman of the subcommittee on analytical methods, for much valuable advice; Dr. Q. H. Gibson and Miss K. Glaser, Miss Quelch, Mr. A. F. Hoffler, and Mr. W. Weedon for valuable assistance. The colour measurement of the carboxyhæmoglobin solutions was carried out at the National Physical Laboratory on behalf of the Medical Research Council.

REFERENCES

Bell, G. H., Chambers, J. W., Waddell, M. B. R. (1945) *Biochem. J.* **39**, 60.
Bierring, E., Nielsen, A., Nielsen, E. (1936) *Acta med. scand.* suppl. **78**, p. 174.
Delory, G. E. (1943) *Analyst*, **68**, 5.
Donaldson, R., Harding, H. G. W., Wright, G. P. (1943) *J. Path. Bact.* **55**, 205.
Gibson, Q. H., Harrison, D. C. (1946) *Biochem. J.* **40**, 247.
Haldane, J. S. (1901) *J. Physiol.* **25**, 331.
Haurowitz, F. (1926) *Novin Lekarsk. Poznanin*, **83**, 10.
Hellmeyer, L. (1932) Medizinische Spektrophotometrie, Jena.
Hüffner, G. (1894) *Arch. Anat. Physiol.* p. 130.
Jenkins, C. E., Don, C. S. D. (1933) *J. Hyg., Camb.* **33**, 36.
Jope, H. M., Jope, E. M., O'Brien, J. R. P. (1943) *Biochem. J.* **37**, ix.
Kennedy, R. P. (1927) *Amer. J. Physiol.* **79**, 346.
King, E. J., Gilchrist, M., Matheson, A. (1944) *Brit. med. J.* i, 250.
Macfarlane, R. G. (1945) *Spec. Rep. Ser. med. Res. Coun., Lond.* no. 252.
— O'Brien, J. R. P. (1944) *Brit. med. J.* i, 248.
Newcomer, H. S. (1919) *J. biol. Chem.* **37**, 465.
Price-Jones, C., Vaughan, J. M., Goddard, H. M. (1935) *J. Path. Bact.* **40**, 503.
Race, J. (1940) British Standards Institution, London. C.F. (c) 4903.
Van Slyke, D. D., Neill, J. M. (1924) *J. biol. Chem.* **61**, 523.
Wintrobe, M. M. (1942) Clinical Hematology, London.

DISSEMINATION OF HÆMOLYTIC STREPTOCOCCI IN AIR

LEONARD COLEBROOK
M.B. Lond., F.R.C.O.G., F.R.S.
MEMBER OF SCIENTIFIC STAFF, MEDICAL RESEARCH COUNCIL

W. P. DALLAS ROSS *
M.B. Camb.
From the Burns Unit at the Birmingham Accident Hospital

THE events which initiate an epidemic seldom come to light. The following story describes events which might well have formed the starting-point of at least a series of cross-infections, but thanks to prompt action they did not. The story is also of interest for its bearing on the mechanism of such cross-infections in surgical wards and as illustrating the value of the bacteriological laboratory in controlling such infections.

It is our practice in this unit to dress all burns in a specially ventilated dressing-room or, occasionally, in a similarly ventilated saline-bath room; they are never exposed in the open wards (Bourdillon and Colebrook 1946). This, combined with a strict dressing technique and the local application of penicillin, has almost eliminated added infections by hæmolytic streptococci for 2½ years (Colebrook et al. 1947). It is necessary, however, to be constantly on the watch for the occasional reappearance of these infections and particularly to detect the streptococci should they at any time be present in the air of the dressing-station. For this purpose it is part of our routine to expose a blood-agar plate (we call it a "settle" plate) whenever patients are being dressed. Sometimes a more severe test for the purity of the air is made with the large-model Bourdillon slit-sampler (Medical Research Council 1947), which can suck as

* Receiving a whole-time grant from the Medical Research Council.

much as 20 c. ft. of air a minute on to the surface of a plate.

Hæmolytic streptococci are very seldom present in the air; none were found on 76 settle plates exposed between Sept. 23, 1946, and Jan. 7, 1947. On Jan. 8, 25, and 27 and on Feb. 1, however, single colonies of streptococci were obtained on the settle plates, and on Jan. 30 the slit-sampler revealed a heavier contamination of the air (76 colonies on one plate). During this period they were also grown in small numbers from the air of the saline-bath room on one occasion (Jan. 23) and from the children's ward of the unit (Jan. 31).

Subsequent investigation of these air-borne streptococci by Dr. V. D. Allison at the Central Public Health Laboratory, Colindale, showed that two distinct types were present on different occasions. Thus, the streptococci recovered on Jan. 8, 25, and 27 and on Feb. 1 from the air of the dressing-station and on Jan. 23 from the air of the saline-bath room were all type-1 strains, whereas those recovered by the slit-sampler on Jan 30 from the air of the dressing-station included a few of this type-1 strain on four of the plates, and a second type, "Imp. 19," on one other plate. This second type was also recovered from the air of the children's ward on Jan. 31.

INVESTIGATION OF SOURCE OF STREPTOCOCCI

The existence of two distinct types was not known to us at the time of the investigation; nor were we aware of any probable source among the patients or the personnel of the unit. Throat swabs of everyone who had been in the dressing-station or saline-bath room when streptococci were recovered from the air yielded none of these organisms; and all the 56 burns under treatment were streptococcus-negative, though one child had given a positive swab (later found to be an Imp. 19 strain) on Jan. 8, 11, and 13. Three subsequent swabs from this child taken during and after local treatment with penicillin had been negative on Jan. 15, 22, and 30. The source of her infection could not be traced.

Since this child's strain was identical with those grown in large numbers from the air of the dressing-station on Jan. 30, and only when this child was in the room, it seems highly probable, indeed almost certain, that the cocci were in some way disseminated in the air during the child's dressing, notwithstanding that a swab from this child's granulating wound did not yield any streptococci on this occasion. The most likely explanation is that the child's bedding became contaminated with hæmolytic streptococci when her wound was infected with that organism (Jan. 8, 11, and 13); the blankets (and possibly also other bedding) were not changed after these organisms disappeared from the wound under penicillin treatment; from these infected blankets, and/or other bedding, the streptococci passed to the crêpe bandages covering the burn, and during the removal of these crêpe bandages they were scattered into the air of the dressing-station. Direct contamination of the air of the dressing-station from the child's bedding or bed-jacket could not have happened, since these had been removed or covered with sterile sheets before she came into the dressing-station.

The suggestion that the child's bedding was the ultimate source of the Imp. 19 cocci found in the air was not merely hypothetical; it is supported by the fact that, though moist swabs taken direct from the bedding yielded no streptococci, these organisms were recovered by slit-sampler plates when the child's blankets were shaken near the machine, on two separate occasions, on the same day as she was in the dressing-station (Jan. 30). On the day following exposure of her burn to the heavily contaminated air of the dressing-station, the Imp. 19 strain was again found on the child's burns. Happily it did not infect either of the two patients who followed her, after an interval, in the dressing-station on Jan. 30.

The type-1 streptococcus found in the air on five occasions appears to have had a totally different origin. On Feb. 1 Mr. A, the surgeon who had been doing all the dressings, remembered that he had a small scabbed-over abrasion on his elbow, dating from before he joined the burns unit on Jan. 1, 1947. It had given him no trouble and, so far as he was aware, had remained perfectly dry throughout January. However, on Feb. 1 Mr. A removed the scab and cultivated the trace of serous fluid beneath it. It gave a pure culture of hæmolytic streptococcus, type 1. On Feb. 2 he swabbed his waistcoat and shirt, and on Feb. 3 his jacket and the skin of his forearm and neck. The waistcoat swab yielded hæmolytic streptococcus type 1; the others were negative. The elbow lesion had been treated with penicillin cream on Feb. 1 and promptly healed.

How did the streptococcus reach the air of the dressing-station from the scabbed-over lesion on Mr. A's elbow? He had never worn his waistcoat during dressings, and his clothing had always been covered with a sterile gown and canvas overshoes. The gown, however, did not give complete cover, because Mr. A is very tall and the gowns are often imperfectly closed at the back. His forearms were exposed during dressings; so there was opportunity for friction between the forearm skin and his gown. It is also possible that, though we detected hæmolytic streptococci only on his waistcoat by our casual swabbing of a small area with a moist swab, a more efficient method of extracting dust from the clothing, like that used in vacuum-cleaning, might have revealed the presence of streptococci also on his shirt, trousers, &c. (see below). In that case the movement of his garments might well have been responsible for the small number of streptococci isolated from the air of the room. In this connexion it will be remembered that Hare (1941) reported finding hæmolytic streptococci on the clothing of healthy throat carriers.

It is therefore suggested that contamination of the air by this type-1 strain was due, in the first place, to imperceptible leakage of serous fluid from Mr. A's lesion, the fluid drying into powdery scales on his forearm and being rubbed off either by the sleeves of his gown or by his clothing.

None of the 42 wounds dressed by Mr. A on the days when his type-1 strain was found in the air of the dressing-station or the saline-bath room acquired this organism. This and the similar fact noted in connexion with the Imp. 19 strain of the child were probably due to the constant decontamination of the air of the dressing-station by the forced-ventilation system, by which the air of the room is completely changed every few minutes (Bourdillon and Colebrook 1946).

SUMMARY

Hæmolytic streptococci recovered from the air of a dressing-station were of two types: type 1 and type Imp. 19.

The evidence suggests that the type-1 strain came indirectly from a small scabbed-over lesion on the elbow of the surgeon doing the dressing (perhaps from his clothes); and that the Imp. 19 strain was scattered in the air during the removal of bandages from a burn which was not at the time infected with that organism, the bandages having become contaminated from the child's bedding.

NOTE ON THE DETECTION OF PATHOGENS, ETC., ON CLOTHING BY "HOOVERING"

In 1944 Dr. R. B. Bourdillon suggested to one of us (L. C.) that a slit-mouthed flexible tube fitted to the air-inlet of the slit-sampler would enable us to sample a much larger amount of dust from clothing, bedding, &c.,

than is obtained by merely swabbing it with a moist swab. Dr. Bourdillon also made the appropriate fittings at that time, but we had not previously used it. After the events recorded in this paper we carried out some trials as follows:

(1) Four streptococcal throat carriers, one of whom, A. B., had also a streptococcal infection of an old burn on his leg, gave the following results:

In the case of A. B. "hoovering" bedding, dressing-gown, &c., gave 42 colonies of hæmolytic streptococci, whereas moist swabs of the same articles gave none; but unfortunately these swabs were taken after the "hoovering," so that it is possible, though not likely, that a large part of the contaminated dust had been removed. Of the 42 colonies obtained by "hoovering," 10 were tested for type. All belonged to type II, which was the type present in the patient's throat and on the leg.

Of the other three carriers, C. D., aged 2 years, gave no hæmolytic streptococci by moist swabbing (swabs before the "hoovering"), but 8 colonies were grown by the "hoovering" test. All the 8 colonies were of the Imp. 19 strain present in the child's throat.

Another child, E. F., yielded one colony of hæmolytic streptococci on "hoovering" the bedding, and none by swabbing.

The fourth child gave one colony by swabbing and none by "hoovering."

(2) In the case of 8 other people with negative throat swabs, 5 of whom were working in the wards in more or less close contact with streptococcal infections, one or two colonies of hæmolytic streptococci were recovered by "hoovering" the clothing from 3 but none from the others. Tests by swabbing were not made in these cases.

So far as it goes, therefore, the evidence suggests that "hoovering" clothing, bedding, &c., is much more likely to detect hæmolytic streptococci than moist swabbing, and that it may prove a valuable aid in the future investigation of cross-infections.

We wish to thank Dr. Allison, whose help in the typing of the streptococci made this investigation possible; Dr. Bourdillon, who taught us to use the slit-sampler and suggested the "hoovering" device; and Mr. Michael Hood for technical assistance.

REFERENCES

Bourdillon, R. B., Colebrook, L. (1946) *Lancet*, i, 561, 601.
Colebrook, L., Duncan, J. M., Butterfield, W. J. H. (1947) *Ibid*, i, 321.
Hare, R. (1941) *Ibid*, i, 85.
Medical Research Council (1947) *Spec. Rep. Ser. med. Res. Coun., Lond.* no. 262 (in the press).

CALCIFEROL IN THE TREATMENT OF CHILBLAINS

S. T. ANNING
M.D. Camb.
TUTOR IN DERMATOLOGY IN THE UNIVERSITY OF LEEDS

CALCIFEROL in high dosage has been widely advertised as effective in the treatment of chilblains. Since this therapy is hazardous unless controlled by estimations of blood-calcium (especially diffusible calcium) and of renal efficiency, it seemed important to assess its effects on chilblains.

The incidence of chilblains during last winter in a group of patients receiving calciferol in large doses for other reasons was determined and compared with the incidence in a group not receiving calciferol.

Material.—The test group (A) consisted of 103 patients (36 men and 67 women) with either lupus vulgaris (92 cases), sarcoidosis (6 cases), tuberculosis verrucosa cutis (3 cases), lupus erythematosus (1 case), or erythema induratum (1 case). Their mean age was 46·3 years (variation 21 to 70) with a standard deviation of 9·2. This group received calciferol daily in tablet form by mouth in doses of 50,000–150,000 I.U. (tab. 'Ostelin,' high potency, Glaxo) for various periods but consistently through the winter months from September, 1946, to March, 1947 (with four exceptions who took the tablets for a shorter time during this period, one for a month, one for two months, and two for five months). The mean individual doses were as follows:

INCIDENCE OF CHILBLAINS IN RELATION TO TREATMENT WITH CALCIFEROL

—	Sex	Experimental group A	Control group B	Control group C
No. in group	M	36 (35%)	19 (39%)	44 (40%)
	F	67 (65%)	30 (61%)	66 (60%)
Total		103	49	110
Mean age (years)		46·3	42·4	43·4
Standard deviation		9·2	15·9	13·1
No. with lupus vulgaris		92 (89%)	45 (92%)	Nil
No. who had had chilblains before 1946–47 winter	M	5 (4·8%)	1 (2·0%)	9 (8·2%)
	F	19 (18·4%)	4 (8·2%)	26 (23·6%)
Total		24 (23·2%)	5 (10·2%)	35 (31·8%)
No. who had chilblains for the first time in 1946–47 winter	M	7 (6·8%)	3 (6·1%)	6 (5·4%)
	F	7 (6·8%)	4 (8·2%)	4 (3·6%)
Total		14 (13·6%)	7 (14·3%)	10 (9·0%)
Total no. with chilblains in 1946–47 winter	M	9 (8·7%)	4 (8·2%)	10 (9·0%)
	F	20 (19·4%)	8 (16·3%)	21 (19·1%)
Total		29 (28·1%)	12 (24·5%)	31 (28·1%)
			Standard error, 8·7	

	Mean individual dose (million I.U.)	*Variation* (million I.U.)	*Standard deviation*
Patients with chilblains	21·4	2·0–42·9	9·2
Patients without chilblains	22·2	2·8–40·2	8·1

The controls were in two groups: group B consisting of 49 patients (19 men and 30 women) with either lupus vulgaris (45 cases), tuberculosis verrucosa cutis (3 cases), or erythema induratum (1 case); and group C of 110 patients (44 men and 66 women) attending primarily for skin conditions other than chilblains or lupus vulgaris. The total control group therefore consisted of 159 patients, none of whom was given calciferol.

Results.—The accompanying table shows that 28·1% of the 103 patients given calciferol developed chilblains, and of the 159 patients not given calciferol, 24·5% in group B and 28·1% in group C developed chilblains. There is no statistically significant difference between the test and control groups as regards the incidence of chilblains. It is thus clear that, in the conditions of this test, a patient receiving calciferol is as liable to chilblains as one who is not receiving it.

Comment.—These results suggest that calciferol is ineffective in preventing chilblains. Further, calciferol appears to have no effect in the treatment of chilblains, since chilblains developed and persisted about the same length of time in all the groups.

As treatment with calciferol in high dosage is not without danger, it would be as well if its use for this purpose were discontinued.

I am grateful to Dr. J. T. Ingram and Dr. F. F. Hellier for allowing me to carry out this investigation on their patients.

EACH bed in the new tuberculosis wards at Anlaby Road Hospital, Hull, has been equipped with a pillow-wireless, according to the Hull *Daily Mail* (Oct. 16).

Medical Societies

BRITISH ORTHOPÆDIC ASSOCIATION

THE annual meeting was held in Manchester on Oct. 24 and 25 under the presidency of Mr. GEORGE PERKINS.

Recurrent Dislocation of the Shoulder

Mr. H. OSMOND-CLARKE described a capsulorrhaphy for recurrent dislocation of the shoulder which he called the Putti-Platt operation. This consisted in a wide approach to the front of the joint with division of the coracoid, subscapularis tendon, and capsule. The distal cut edge of the subscapularis tendon was sewn to the neighbourhood of the anterior lip of the glenoid, and the proximal portion of the tendon was made to overlap the suture line. The coracoid was repaired and the wound closed.

Mr. J. C. ADAMS had investigated the results, after two years or more, of 114 out of 159 operations for recurrent dislocation of the shoulder in the Royal Air Force during 1940–45. He said that 21 recurrences had taken place after 59 Nicola operations, and 2 after 37 Putti-Platt operations. The intervals before recurrence varied between four months and five years, averaging twenty-two months. Among 79 shoulders adequately explored, the glenoid labrum was found detached in 69 and soundly attached in 10. Adequate radiography of 68 patients revealed a posteromedial defect in the humeral head of 56; an anteroposterior view with the limb rotated inwards through 60–70° was advised. The range of movement was almost full after Nicola's operation; lateral rotation was often diminished after Bankart's operation, and rather more so after the capsulorrhaphy. The relatively free range after Nicola's operation was perhaps a factor in recurrent cases, which did not always show atrophy of the reattached tendon. The good results of the other operations were attributed to the fibrous tissue formed in the front of the capsule, which limited lateral rotation.

Mr. A. L. EYRE-BROOK gave a detailed analysis of 20 consecutive cases operated on by the anteromedial approach. These lesions were found: anterior detachment of the glenoid labrum (Bankart's lesion) alone in 6 cases, a posteromedial defect in the humeral head alone in 3 cases, a combination of these two defects in 10 cases, and detachment of the subscapularis from the lesser tuberosity in 1 case. The bony defect was best revealed preoperatively by radiography from above with the film in the axilla and the arm laterally rotated through 70°. Radiography often disclosed also a bony subglenoid outgrowth in cases of Bankart's lesion. In cases showing this lesion at operation, a modified Bankart's operation was performed. In cases not showing this, but having a defect in the humeral head, multiple osteotomy of the coracoid had been performed (2 cases), and more recently the application of an iliac graft to the front of the scapular neck. After operation the arm was bandaged to the side for four to six weeks. Work was resumed after a further six weeks. In 12 cases followed for periods of six months to four years, no recurrence had been found.

Mr. A. B. PAIN had examined the case-records of 43 operations for recurrent dislocation of the shoulder in 33 patients treated in the Leeds area during the preceding fifteen years. Of the patients, 1 had bilateral operations, 7 others had two operations, and 3 had as many as three operations each; 6 were epileptic. Among 28 patients traced, seven different types of operations had been performed as follows (recurrences in parentheses): Clairmont 1 (1), Henderson 13 (9), subscapularis tenotomy 3 (1), Nicola 12 (4), Bankart 2 (1), capsular plication 1 (0), bone block 4 (0). Recurrence took place at any time up to seven years after operation, but in 12 out of 18 instances it was within a year—in 6 of them within three weeks.

Other Papers

Prof. JACQUES LEVEUF, in a paper on the *Treatment of Acute Osteomyelitis Viewed from the Anatomical and Physiological Basis*, expressed the view that in hæmatogenous osteomyelitis the first bony lodgment of the staphylococcus is not usually the metaphysis but the neighbourhood of the entry of the perforating artery, where a cortical abscess forms, with usually a very small lamellar sequestrum. Spread is mainly towards the surface, but also along the artery and its branches, producing further cortical lesions and occasionally medullary ones. Professor Leveuf, who has practised plaster-of-paris immobilisation in this disease for twenty years, condemns bone operations in the acute stage, and especially metaphyseal drainage. The soft-tissue abscess should be drained between the fifteenth and twentieth day; formerly the wound was left widely open, but now, with the aid of penicillin, it is closed forthwith.

Prof. S. L. BAKER, in speaking of the *Histology of Callus*, stated that the first sign of bone appeared within the first week in an area of gelatinous œdema in the mass of young connective tissue which invades the hæmatoma about a fracture.

This bone is of a type called woven bone, because of the irregular arrangement of the fibres, which with a connecting substance form the osteoid matrix, in distinction from lamellar bone, in which the fibres have a parallel arrangement. Whereas woven bone can be laid down rapidly in connective tissue, lamellar bone forms slowly and can only be laid down on a surface. Woven bone forms about blood-vessels, and so the orientation of its trabeculæ is determined by the vascular arrangement, whereas that of the trabeculæ of lamellar bone is determined by the stresses to which it is submitted. Woven bone is usually replaced slowly by lamellar bone. The formation of cartilage in callus appears to depend largely on movement, being frequent after rib fractures and in animals. Cartilage sometimes forms a ring about the fracture and may result in pseudarthrosis, but commonly it is replaced gradually by bone. Callus is no respecter of the periosteum, often passing well outside it.

In certain rare instances, said Professor Baker, especially fragilitas ossium, there is a prodigious formation of callus which may be taken for sarcoma. Dr. J. F. BRAILSFORD and Mr. B. L. MCFARLAND confirmed this danger.

Mr. ROLAND BARNES reported on 22 cases of *Paraplegia in Cervical Column Injuries*, which he subdivided into (1) flexion injuries (dislocation 8, crush fracture 4, acute retropulsion of an intervertebral disc without bone injury 3), and (2) hyperextension injuries (dislocation 1, injury of arthritic spine 6). He believed that with acute retropulsion of an intervertebral disc cerebrospinal-fluid block called for emergency laminectomy and not merely skull traction. With paraplegia following hyperextension injury of an arthritic spine there was little or no evidence of bone injury. These patients were all more than fifty years old. A complete tear of the anterior common ligament had been produced in 1, and it seemed probable that not only was the stiff extended arthritic spine unduly prone to hyperextension injury, but the cervical lordosis and often associated thoracic kyphosis would aggravate the consequent traction injury to the spinal cord, which seemed a probable cause of the paraplegia. Prof. GEOFFREY JEFFERSON, F.R.S., agreed with what had been said but had an open mind about crediting laminectomy with the improvement which sometimes followed it.

Mr. D. LL. GRIFFITHS advocated the following steps in the *Management of Acute Ischæmia in an Injured Limb*.

(1) Adequate general investigation, including arterial blood-pressure and blood hæmoglobin estimation.

(2) Removal of all possible sources of external pressure.

(3) Attention to the patient's general condition, with special reference to maintenance or restoration of a satisfactory blood-pressure.

(4) Reduction of the associated fracture, if any; this may assist the collateral circulation but should be attempted only once.

(5) Operative exploration of the artery, except in cases of over twenty-four hours' duration in the lower limb, or in cases showing obliteration of both anterior and posterior tibial arteries. Preliminary arteriography is helpful. Complete division demands ligation; incomplete division provides an opportunity for a trial of arterial suture; bruising of a length of artery calls for resection; no operation should be performed on the artery if it is occluded by spasm without any obvious arterial injury.

(6) Paralysis of the cervicothoracic or lumbar sympathetic system by local infiltration.

(7) Other measures to improve the collateral circulation: slight elevation or slight depression of the limb, as suits the patient's comfort; cooling the limb, but without the use of ice; warming the patient; administration of morphine, alkalis, and

penicillin. Tobacco is usually condemned, but alcohol may help.

Mr. JOHN CHARNLEY gave a discourse, illustrated by models, on some of the basic mechanical principles used in the *Reduction and Splinting of Fractures*.

Mr. C. H. CULLEN discussed *Causalgia* on the basis of 24 cases he had seen during the war. Of 17 in which sympathetic block was successfully achieved with 2% procaine ('Novocain'), as shown by peripheral loss of sweating, 14 were completely relieved temporarily. For such, sympathectomy was the treatment of choice; in the 8 patients submitted to it, the results were uniformly good, except that 1 patient, in whom part of the stellate ganglion was spared, was not completely cured. Radiotherapy was less successful than sympathectomy, and was reserved for cases not responding to sympathetic infiltration.

Mr. T. J. FAIRBANK spoke on *Fracture-subluxation of the Shoulder*. Among 115 cases of fracture about the shoulder, he had found 12 with radiologically demonstrable downward subluxation of the humeral head; in 11 of these it was a complication of fracture of the neck of the bone. Clinically a groove could be felt between the acromion and the humeral head, which could usually be abolished by lifting the humerus actively or passively, or by recumbency. In the normal subject little downward subluxation occurred except during anæsthesia, and muscle tone appeared to be the main factor preventing it. At follow-up, a year after injury, the subluxation had sometimes disappeared, but it sometimes persisted for three years or more. Of the patients, 9 had been treated for their fractures with collar-and-cuff slings and 3 with abduction frames. It was suggested that, in the treatment of fracture of the humeral neck, a triangular sling is preferable to a collar-and-cuff, and that if abduction is necessary a plaster-of-paris spica should be used. Sir REGINALD WATSON-JONES considered it important to distinguish between subluxation due to the original violence and that due to diminished muscle tone.

In considering the *Treatment of the Unreduced Pathological Dislocation of the Hip from Septic Arthritis in Infancy*, Mr. A. F. BRYSON excluded patients aged more than twelve months at the time of the acute illness. In most it occurred in the first nine months. His 16 cases were all unilateral, and 15 were operated upon. One underwent an unsuccessful Colonna's arthroplasty. Of 3 treated by osteotomy, 1 secured stability, but the other 2 continued to show progressive shortening, flexion, and adduction. Arthrodesis was much the best procedure. Eleven patients were so treated; bony fusion occurred within a few months in 7 of them, and after subsequent osteotomy in another. Operation should be delayed till the age of twelve or thirteen years, because of the great amount of activity possible till then and because earlier bony fusion is not only difficult to obtain but does not fully prevent subsequent flexion and abduction deformity. Preliminary weight traction has been found of little value in diminishing shortening, but freeing of the upper end of the femur at operation allowed considerable correction of real shortening, which in 1 case was reduced from $3^1/_2$ in. to 1 in. The denuded bone surfaces were secured with Platt's miniature tri-fin nail. Only 1 patient had complained of pain in the back—eighteen months after an operation performed at the age of fourteen years—but she claimed to have walked 40 miles in a day. Professor LEVEUF advocated arthroplasty in such cases, even although unilateral. Mr. R. I. STIRLING considered that a shelf operation had a place in the treatment, in order to limit shortening before the best time for arthrodesis had arrived.

Miss E. L. WILLIS summarised the *End-results in Fractures of the Femoral Neck* in 192 cases treated in the university department of orthopædics at the Manchester Royal Infirmary, with a death-rate of 8% within three months of injury. Out of 113 patients with subcapital and transcervical fracture, 50 were seen two or more years after injury: 22 had good results and 15 poor; 13 showed avascular necrosis of the femoral head. Of 74 fractures treated by Smith-Petersen nailing, 41 showed radiological union. Of 79 basal and pertrochanteric fractures, 51 were treated by well-leg traction, with union in 43. There were 23 good clinical results among 28 patients examined more than a year after injury.

Reviews of Books

Radium Dosage

The Manchester System. Editor: W. J. MEREDITH, M.SC., F.INST.P., physicist to the Christie Hospital and Holt Radium Institute, Manchester. Edinburgh: E. & S. Livingstone. 1947. Pp. 124. 15*s*.

THIS book presents in one volume a complete dosage system for mould, intracavitary, and interstitial gamma-ray radium therapy. By means of dosage tables and distribution rules it attempts to solve the three problems of radium therapy: how much radium should be used; how it must be arranged; and how long treatment should last. It is based on papers published since 1934 by the staff of the Christie Hospital and Holt Radium Institute, including Ralston Paterson, M. C. Tod, H. M. Parker, F. W. Spiers, S. K. Stephenson, and W. J. Meredith. These papers are well known to physicists and radiotherapists, and the book will replace well-thumbed "reprints" in all departments where radium therapy is practised.

Milk and Food Sanitation Practice

H. S. ADAMS, B.SC., chief, Bureau of Environmental Hygiene, Minneapolis; lecturer, School of Public Health, University of Minnesota. New York: Commonwealth Fund. London: Oxford University Press. 1947. Pp. 311. 18*s*.

THIS well-written book places the whole question of food protection in a modern setting.

The first section, which deals with milk sanitation, gives an interesting survey of the steps taken in the United States to improve the quality of market milk, and shows that great progress has been made in pasteurisation and its acceptance by the public. Mr. Adams gives minute instructions about the standards of milk production, also devoting a chapter to unpleasant flavours in milk and means of avoiding them. Arguments against pasteurisation are analysed and demolished. The second and shorter section deals more broadly with food control, discussing inspection of food, the hygiene of the worker, the safety of the water-supply, protection from contamination, and the war against the perpetual enemies of food—insects and rodents.

The book is a valuable statement of the modern attitude towards food and milk; and is besides a lesson to us in Great Britain on the rather tiresome subject of how far we lag behind in these matters.

Atlas of Cardiovascular Diseases

IRVING J. TREIGER, M.D., assistant professor of medicine, University of Illinois, Chicago. London: H. Kimpton. 1947. Pp. 180. 50*s*.

IN this atlas the anatomy of the normal heart and the pathology of the diseased heart are shown in photographs of specimens and in radiograms; and as a rule the corresponding cardiographic changes are also illustrated; moreover, each common disorder of the cardiovascular system is represented by a case of which brief clinical details are given. The study of photographs, however good—and those in this atlas are exceptionally good—is not an effective substitute for the examination of the material itself in the post-mortem room, nor will the written matter here take the place of a textbook; but in so far as the correlation of first-class radiograms with morbid anatomy, as shown in photographs, can help the student to a clear conception of cardiovascular disease, this atlas provides excellent instruction.

Experimental Physiology for Medical Students (4th ed. London: J. & A. Churchill. 1947. Pp. 299. 18*s*.).—Prof. D. T. Harris notes that in the six years which have passed since the last edition of his book there have been great advances in the study of electronics, especially during the war years. Students nowadays have a first-hand knowledge of radio devices, and he has therefore included in the new edition such simple assemblies as are thought to possess definite advantages—for example, a robust micro-ammeter with simple amplifier instead of a highly sensitive and costly galvanometer. This has made it possible to replace the older experiments on nerve by simple exercises illustrating the electrochemical view of the propagation of nerve impulses. The book remains a standby for the student to use in conjunction with his theoretical textbook.

Comprehensive
Anti-Anæmia
Therapy

'VENTRON'

Capsules

In many instances of microcytic anæmia, especially those associated with nutritional inadequacy, there may be a lack of blood-forming elements other than iron; consequently, it is often advantageous to supplement iron therapy by giving the erythrocyte-maturing factor in the form of desiccated gastric tissue, together with vitamins B_1 and B_2 as general aids to nutrition.

Ventriculin is a stable anti-anæmic substance derived from gastric tissue and is a potent erythrogenic stimulant inducing active hæmatopoiesis with rapid elevation of the red blood-cell count.

A combination of Ventriculin in concentrated form with vitamins B_1 and B_2 and ferrous sulphate is available under the name 'Ventron' in bottles of 50 and 1,000 capsules.

PARKE, DAVIS & CO., 50 BEAK STREET, LONDON, W.1

Laboratories: Hounslow, Middlesex *Inc. U.S.A., Liability Ltd.*

Protein-replacement therapy

HEPOVITE

A dry granular preparation of malt and enzyme-hydrolysed liver protein, rich in *natural* vitamins and essential amino-acids.

COMPOSITION

(Each 30 grammes contains)

"Protein" (N x 6.25)	15 grm
Carbohydrate (Maltose)	11.4 grm
Vitamin A	500 i.u.
Vitamin D	50 i.u.
Aneurine HCl	1.0 mg
Riboflavin	2.0 mg
Nicotinic acid	6.5 mg
Pantothenic acid	11.3 mg
Pyridoxine	0.32 mg
Biotin	0.065 mg
Folic acid	0.05 mg
Inositol	8.1 mg

Choline, Calcium, Phosphorus and Iron are also present.

DOSAGE

¼ oz. (7 grms) three times daily is sufficient to provide the necessary protein supplement. Hepovite can be taken on a spoon, sprinkled on food or dissolved in milk, fruit-juices or soda-water.

INDICATIONS

To restore and maintain the nitrogen balance in the presence of tissue destruction and repair, e.g. burns, injuries and post-operative states. To provide a dietary supplement in all cases of nutritional deficiency, pregnancy, peptic ulcer, ulcerative colitis and the toxæmias of pregnancy.

Hepovite is issued in tins of 5 oz. at 9/-★ each. Further details on application to the Home Medical Department, Speke, Liverpool, 19, or 50, Bartholomew Close, London, E.C.1

★ *Prices apply to Gt. Britain and N. Ireland only and are subject to professional discount*

144-3/K7

Made in England by

EVANS MEDICAL SUPPLIES LTD

Liverpool and London

THE LANCET

LONDON: SATURDAY, NOV. 29, 1947

Ambulances

RELIABLE arrangements for moving patients by ambulance are an important element in any medical service. Little is heard of the preparations for the ambulance system in the National Health Service, but its organisation is being considered.

Ambulance services in this country were largely amalgamated during the war, but they have now been restored to their pre-war owners and show a tendency to revert to their pre-war standards. Is this necessarily a good thing? Ought we not to use the opportunity for a fresh approach? In greater London, for example, before the war there were various ambulance services. The greatest was that of the London County Council, operating within the boundaries of the county. Outside those impassable boundaries there were many small ambulance services owned by the boroughs and the counties. Borough ambulances could take the patient from the borough to any hospital but not vice versa, and county ambulances were to be used only for the county hospitals. Rates of payment were highly diverse: some ambulances were free, while some had a mileage rate, and the patient proceeding to a voluntary hospital in a L.C.C. ambulance had to pay cash down or be taken willy-nilly to a L.C.C. hospital. Finally there were private ambulances—more particularly those of the Joint Committee of St. John and the Red Cross—which disregarded all boundaries and charged a moderate fee.

In the new health service the ambulances will presumably be free; so one problem at least will disappear. Indeed, the L.C.C. has already dropped its charge for journeys to hospital when the hospital calls the ambulance. But what of the boundary question? Presumably borough and county boundaries will disappear, for in a national service they will have no significance. Will they be replaced by regional boundaries? Since it has been said that regional boundaries are to be no bar to the movement of patients, presumably ambulances will be able to cross them. Up to this point the new system must of itself be an improvement, provided the larger ambulance services do not acquire a larger bureaucracy to hinder them. But there remains a risk that the present speed of dealing with cases will be accepted as a standard to maintain rather than as a basis for improvement. Despite the somewhat rosy statistics which are published, we have heard doctors complain of interminable delays in obtaining ambulances. Further information would be welcome, but it seems at least to be clear that an hour's delay before the ambulance starts is not unusual at any time of year—particularly at the "peak" hours of midday and evening—and that in winter the delay is often much greater. Admittedly, if the case is one of accident or can be certified as "life or death" an accident ambulance can be called, and this will start more or less at once. But the bulk of patients needing immediate admission to hospital are not in this desperate plight; so, though they may be very ill and the anxiety of their friends and doctor very great, they have to wait—to their medical disadvantage where (in pneumonia for example) active treatment should begin at once. Presumably this is because there are not enough ambulances to go round, and because old ones cannot be replaced. Is it, however, certain that a sufficient expansion is envisaged not only to ensure that patients shall not be kept waiting unduly, but also to meet the added requirements that the National Health Service will bring? There are various concealed requirements which rationalisation of hospital work will reveal more clearly. Thus it is evident that something will have to be done about the patient who needs outpatient treatment but is unable to travel to and from hospital, either because of his physical disability or (in the country) because public transport is lacking. Nowadays such a man either goes without the treatment or is given a hospital bed which could be put to better use. It looks as though the scope of the ambulance service must be enlarged to include the wide use of sitting ambulances, to work in connexion with outpatient departments.

Running a large ambulance service is a technical job which few are qualified to undertake; and it is not for the inexperienced to suggest how these necessary improvements should be made. The county health authorities, however, have great experience, and they are to bear the whole burden in the future. We trust that they are dissatisfied with the present service and are planning boldly for something better.

Cholera and Hysteria

CHOLERA inspired the first attempt at international regulation of quarantine procedures, and the Egyptian cholera outbreak has revealed the flimsy foundation on which a hundred years of such efforts have been based. Since the first quarantine conference in 1851 those concerned with international quarantine have had a twofold purpose: on the one hand, they have sought to promote measures which would prevent the spread of disease from country to country, and on the other hand they have tried to obtain agreement on an upper limit of severity for such measures, which would prevent unnecessary interference with trade and travel. In the Egyptian outbreak the first of these objectives—the prevention of international spread—seems to have been achieved: for cholera has not so far appeared in any other country west of the Persian Gulf, and further epidemic extension is unlikely now that the incidence in Egypt has declined and the Mecca pilgrimage has been concluded. It is the second objective—the avoidance of undue dislocation of trade and travel—which has not been attained, and the story of the failure can be read between the lines of the official Weekly Epidemiological Record of the World Health Organisation and in the press.

For preventing undue interference with international traffic three things are necessary: (1) there must be early and accurate information about the onset and spread of the epidemic and the measures taken by the country of origin; (2) other countries must refrain from measures beyond the maxima laid down by the International Sanitary Conventions; and (3) the measures taken against the infected country must be promptly reported. Though many governments deserve great credit for the way they have fulfilled their obligations, far too many others have failed under one or more of these heads. As regards notification, Egypt was prompt to report the outbreak as soon as it was bacteriologically confirmed; but lack of information about its progress and spread was certainly the reason for some of the excessive measures taken against her. It was also unfortunate that there was delay on the part of British military in notifying the Egyptian authorities of four cases in the Canal Zone—though these in no way supported the original allegation of importation from that zone. Again, some neighbouring countries do not seem to have realised the value of negative official reports as a means of countering false rumours, such as those alleging that cholera had arrived in Greece, Italy, and Turkey. (The excellent reports from Saudi Arabia concerning the pilgrimage were a notable exception.) But a second and greater failure lay in the imposition of control measures far in excess of those described in the conventions. Though the quarantine committee of the World Health Organisation Interim Commission had held a special emergency meeting, under the chairmanship of Dr. P. G. STOCK, and had specifically stated that the measures against cholera laid down in the conventions in force were adequate, certain countries—and not always those most at risk—actually closed their frontiers to all passengers and goods coming from Egypt. The process was a gradual one, in the nature of a vicious circle. At first measures within the conventions were imposed, such as medical examination and surveillance of passengers and prohibition of importation of fresh food. Then alarmist rumours and press reports, not always accurate, of what other countries were doing roused public opinion, before which some health authorities seem to have given way. Thus it is reported that Italy eventually decided that arrivals from Egypt by air should be held under observation in a hotel in Ostia; the local inhabitants erected barricades, and the bus containing the travellers was turned back after something approaching a riot. France, after a short interval, abruptly forbade admittance to passengers and even mail from Egypt, not only to her metropolitan territory but to all her dependencies. Greece, after quite reasonably requiring sea and air traffic from Egypt to call at specified places, ended by suspending all such traffic. Austria prohibited the importation of all foodstuffs, not only from Egypt but from eight countries "threatened" with cholera. Other countries prohibited the import not only of foodstuffs but of Egyptian cotton, oblivious of the fact that they had been importing for years jute from Bengal and rice from China and Indo-China—the main endemic and epidemic centres of cholera—without any evil consequences: at one point it was even reported that ships could not be chartered to take to Egypt the Chilean nitrates on which the crops depend. In the third place, many of these measures taken against Egypt were not communicated promptly, or even at all, to the World Health Organisation at Geneva, as required by the conventions. Hence the sea and air lines were unable to learn from an official central authority what they would be allowed to do.

Cholera has been called, in quite a different sense, the "disease of fear"; and certainly fear of it has caused incalculable trade and traffic losses which were largely needless. The lesson will have to be studied carefully when the time comes for the World Health Organisation to revise the conventions. It seems clear, however, that it was not the conventions that were at fault, and that what we have witnessed was a partial return to the "quarantine of the jungle."

The Enigma of Hæmophilia

WHY does hæmophilic blood not clot when it is shed? What part of the clotting reaction has failed, and can the defect be remedied by treatment? No completely satisfying answer to these questions has yet been found, but research in many countries has clarified our ideas.

It is agreed that the defect in hæmophilia lies in the failure of conversion of prothrombin to thrombin in the presence of ionised calcium and thrombokinase—the first clotting reaction. Two explanations of this failure have been most popular. The first, associated particularly with the researches of FONIO, is that the abnormality lies in the platelets; it is thought that the blood-platelets are abnormally resistant to disintegration and fail to provide the necessary thrombokinase. This hypothesis has in the past received much support; HOWELL, for example, considered that there is in hæmophilia an inherited defect of the platelets or of the megakaryocytes from which they are derived. The second explanation invokes a deficiency in the plasma of thromboplastin (thrombokinase), the platelets being normal. As long ago as 1905 SAHLI noticed that hæmophilic blood will clot promptly if a small amount of normal plasma is added, and in 1927 FRANK and HARTMANN [1] underlined this observation by pointing out that the coagulation-time of hæmophilic blood can be restored to normal by mixing with normal plasma. PATEK and TAYLOR,[2] and BENDIEN and VAN CREVELD [3] isolated globulin fractions of plasma that had this restorative property; and in 1939 HOWELL,[4] abandoning the platelet hypothesis, stated that these results provide real evidence for the view that blood plasma normally contains a specific substance that accelerates the clotting process, and that this substance is deficient in the plasma of hæmophilic patients. HOWELL proposed the name "plasma thromboplastin" for this substance. It is essentially the same as MORAWITZ's "thrombokinase"; but this name suggests a protein substance of enzymic nature, whereas HOWELL was able to show that thromboplastin can be freed of protein, and MERTZ, SEEGERS, and SMITH [5] produced evidence that the reaction, prothrombin + $Ca^{"}$ + thromboplastin = thrombin, is not

1. Frank, E., Hartmann, E. *Klin. Wschr.* 1927, **6**, 435.
2. Patek, A. J., Taylor, F. H. L. *J. clin. Invest.* 1937, **16**, 113.
3. Bendien, W. M., van Creveld, S. *Acta med. scand.* 1939, **99**, 12.
4. Howell, W. H. *Bull. N.Y. Acad. Med.* 1939, **15**, 3.
5. Mertz, E. T., Seegers, W. H., Smith, H. P. *Proc. Soc. exp. Biol., N.Y.* 1939, **42**, 604.

enzymic but a true chemical combination. The name "thromboplastin" is therefore more accurate. HOWELL also noted in support of the plasma-deficiency theory some experiments by GOVAERTS and GRATIA [6] suggesting that hæmophilic platelets only exhibit exceptional stability in hæmophilic plasma, and that in normal plasma they behave normally. In other words, the platelets themselves are normal.

This theory, though satisfactory in many ways, still leaves important points unexplained. How is the plasma thromboplastin brought into action? How is intravascular clotting avoided? Are the platelets denied all part—as LENGGENHAGER [7] has suggested—in the clotting process? In some recently published experiments QUICK [8] attempts to answer these questions. He starts from the observation of BRINKHOUS [9] that in hæmophilic blood prothrombin is only slowly converted to thrombin, and that after such blood has clotted much prothrombin remains in the serum. QUICK uses the consumption of prothrombin, rather than the coagulation-time of the blood, as a measure of the completeness of the first coagulation reaction. He confirms the finding that hardly any prothrombin is consumed in the clotting of hæmophilic blood, whereas in normal blood 80–85% has been converted to thrombin an hour after clotting. But the prothrombin in hæmophilic blood can be converted to thrombin just as readily as that of normal blood if thromboplastin is added. Either normal plasma or thromboplastin prepared from rabbit brain tissue is effective; but of course plasma thromboplastin does not cause clotting in vivo, whereas tissue thromboplastin does. In order to explain this difference, QUICK again explored the rôle of the platelets. An extract of platelets only slightly accelerates the clotting-time of recalcified oxalated plasma, suggesting that the platelet extract provides no significant amount of thromboplastin. Now in a platelet-free plasma conversion of prothrombin to thrombin is very slow; nevertheless such plasma added to hæmophilic plasma will still restore the normal conversion of prothrombin; in other words thromboplastin is still present. If the hæmophilic plasma is freed as far as possible of platelets by rapid centrifuging, then the addition to this plasma of platelet-free normal plasma will not bring about the relatively complete conversion of prothrombin to thrombin. QUICK explains this by saying that the thromboplastin in normal plasma exists in an inactive form, "thromboplastinogen," which is activated by an enzyme released by the platelets on disintegration. He thus restores the platelets to an active part in blood coagulation; and the defect in hæmophilia is that when platelets disintegrate, and liberate their activator, there is insufficient thromboplastinogen in the plasma to allow formation of enough thromboplastin for significant conversion of prothrombin to thrombin. But the state of affairs is not quite so straightforward, for it has repeatedly been noted by direct observation of shed hæmophilic plasma that platelets do not in fact agglutinate or disintegrate properly. QUICK quotes the findings of PINNINGER and PRUNTY [10] that proper agglutination and disintegration of platelets depends on the formation of a minimal amount of thrombin. In normal blood some thrombin is formed when plasma comes into contact with a foreign surface, but this does not happen in hæmophilic blood.

All the newer evidence is thus in favour of the hypothesis that hæmophilia is a congenital deficiency of plasma thromboplastin, and that all the observed consequences—failure of the blood to clot, non-conversion of prothrombin to thrombin, and even the unusual stability of the platelets—can be traced to this deficiency. It is thus clear that in treatment the provision of thromboplastin is the only correct method. This can be done by transfusing with normal blood or plasma, or by giving intravenously the thromboplastin concentrate known as antihæmophilic globulin, and so restoring the plasma to normal, even if only temporarily. A good case can be made out for giving transfusions before any operative measure, such as tooth-extraction. Since thrombin is the main hæmostatic agent, it is a reasonable contention of QUICK's that the measure of conversion of prothrombin to thrombin gives a better estimate of the likelihood of bleeding than does the simple coagulation-time. For local use thrombin preparations are the first choice.

There are still points to be cleared up, such as the mechanism of the clotting of hæmophilic blood without consumption of prothrombin; and more evidence is needed about the interaction of platelets and thrombin. But much progress has been made, and this should be reflected in simplification of the treatment of hæmophilia.

6. Govaerts, P., Gratia, A. *Rev. belge Sci. méd.* 1931, **3**, 689.
7. Lenggenhager, K. *Schweiz. med. Wschr.* 1946, **76**, 411.
8. Quick, A. J. *Amer. J. med. Sci.* 1947, **214**, 272.
9. Brinkhous, K. M. *Ibid*, 1939, **198**, 509.
10. Pinninger, J. L., Prunty, F. T. G. *Brit. J. exp. Path.* 1946, **27**, 200.

Service Medicine

No army designed for defence can hope to be fully prepared for war. The date of the conflict, its form, its place, and its scope—these determine the army's constitution, and they can only be guessed. But the guess should take full account of past experience.

The testimony of civilian doctors who worked in or with the Services during the war carries weight because they were in a position to judge the effect of the Service setting on the exercise of their skill. In the first of his Croonian lectures to the Royal College of Physicians last week Dr. E. R. BOLAND offered some friendly criticism on these lines. As a consultant with Allied Force Headquarters, C.M.F., he was impressed with the wastage of medical man-power by the maintenance of separate medical departments for each of the Armed Forces. In voicing the claim for a unified medical service, which has been repeatedly made in these columns,[1] BOLAND admitted that each of the Services has particular problems and needs; but these, he holds, could be met through special formations within the main service. Unification is in fact being considered, but he is not sanguine about the outcome; and he urges that at least medical procedure and documentation should be standardised. In war-time each of the Services uses the medical organisation of the others as occasion demands; and those who served will recall the irritation and confusion caused, particularly at hospital level, by differences in procedure between the three Forces. There will

1. See *Lancet*, 1946, i, 349; *Ibid*, 1946, ii, 421; *Ibid*, p. 533; *Ibid*, 1947, i, 373.

be strong support, too, for BOLAND's further recommendation that the head of the medical services, whether at the War Office or in the field, should be granted a higher status, and that control of these services should pass from the Adjutant-General to a separate branch of the General Staff. In pressing for increased opportunities for training and advancement in clinical work, as opposed to administration, he underlined a defect long plain to doctors both in and outside the Services. The clinician's chances of achieving high rank, though greater than formerly, are still too few; and the effect is to impair efficiency. BOLAND finds it significant that on the whole the men who have brought most lustre to the R.A.M.C. are the pathologists and hygienists, for whom the road to promotion is wider than for others. Openings for advancement, however, must be paralleled by opportunities for training,[2] and BOLAND favours the establishment at home and abroad of Service hospitals which would receive both Service and civilian men and women.

Under modern conditions even more important than increased clinical efficiency is preparation of the Regular skeleton to bear the weight of a vast and rapidly growing body in time of war. Besides being strong, this skeleton must be flexible, and the high level of efficiency demanded of its components cannot be achieved without special training which anticipates the strains of war. On mobilisation, almost at a moment's notice the lance-corporal clerk is appointed chief clerk, and the quartermaster-sergeant is commissioned as lieutenant-quartermaster. Everywhere officers and men are assigned duties a step beyond what they would normally consider the limit of their capacity. But war-time expansion does not involve only advancement in a familiar field; for the quartermaster may find himself a registrar administering a hospital, while his Q.M.S. becomes second-in-command of a medical stores. If this transition is to be smooth, and if, as BOLAND hopes, medical man-power is to be saved in war-time by greater employment of non-medical officers, then preparatory experience is essential. In the Army the possibility of war-time expansion is, of course, acknowledged by training officers and others for duty in higher ranks; but the late war showed that senior N.C.O.'s and non-medical officers in the R.A.M.C. had not been versed in the "shadow" posts which they came to occupy with the outbreak of war. Their training, to be effective, calls for boundless prevision, and similar prevision is required for the curtailment of the medical officer's round of clerical work. In war there is no short-term remedy for the shortage of doctors; and in 1939–45 the needs of the civilian population were barely served. BOLAND suggests that with clerical help the Services could have dispensed with at least one in fifteen of their medical officers; and many, with bitter memories of long hours spent with pen in hand, may retort that this estimate is too moderate. However this may be, experience shows that the saving cannot be effected after war has broken out, for then clerks are at a premium. The time to start saving is now, and a possible solution would be recruitment to the Territorial service of more women clerks who could perhaps be tempted by the prospect of free clerical training.

2. *Ibid*, 1945, ii, 531.

Annotations

CALCIFEROL FOR CHILBLAINS

CALCIFEROL (vitamin D_2) is one of a series of products formed when ergosterol is irradiated.[1] Windaus et al.[2] found that the photochemical reactions involved were:

Ergosterol → Lumisterol → Tachysterol → Calciferol →
Toxisterol → Suprasterol 1
Toxisterol → Suprasterol 2

Its administration in large doses has had much attention since Dowling and Prosser Thomas[3] in Britain, and Charpy[4] in France proved that when thus given it usually relieves or cures cutaneous tuberculosis. Once the work on tuberculosis had been accepted, it was inevitable that other uses for the remedy would be sought, and equally inevitable that it would be tried for chilblains.

Reviewing an enormous and unsatisfactory literature, Winner and Cooper-Willis[5] note that many Continental doctors regard chilblains as manifestations of tuberculosis—a view not accepted here. They recall that Almroth Wright[6] described diminished coagulability of the blood in chilblain subjects, thus providing the basis for the popular treatment with calcium, but that Hallam[7] did not confirm Wright's findings and that Percival and Stewart[8] showed that in these subjects the blood-calcium level was consistently normal. There appears, in fact, to be little scientific justification for giving calcium (with or without vitamin D) for the prevention or cure of the lesions. Yet many competent doctors aver that they often do good, and it will require something a good deal more weighty than the obiter dicta of consultants and scientists to convince these men that their clinical findings are erroneous.

Phelan[9] states that Tecoz, Lavril, Pelicier, and others have successfully used calciferol in the treatment of chilblains by giving 15 mg. (600,000 I.U.) in a single dose, and reports that of 14 cases 8 were cured and 3 improved by the oral or hypodermic administration of similar doses of the vitamin. In a paper which we publish this week Dr. Anning reaches the contrary conclusion that calciferol is ineffective. The controversy may perhaps continue until we adopt the American expedient of ensuring an equable temperature in our houses. Adequate central-heating banishes chilblains, and in many parts of Canada and the United States where the weather can be very cold the word "chilblain" has almost vanished from the vocabulary.[10]

In large doses calciferol is a dangerous substance, and its dangers have been repeatedly emphasised.[3 11 12] Like the sulphonamides, it can be used carelessly with success on many occasions, so that the unwise physician begins to feel "what fools these clever men be"; and then there is an unexpected tragedy. Though many people can take large doses for short periods without apparent harm, a few are intolerant from the first, rapidly developing nausea, headache, vomiting, and prostration. Moreover calciferol can cause a quiescent tuberculous focus in the lungs to flare into activity, and its use is contra-indicated in persons with arterial or renal disease. When given for chilblains in doses of, say, 50,000 I.U. daily for two or three weeks, it does not carry much risk, provided the patient is healthy;

1. Goodman, L., Gilman, A. Pharmacological Basis of Therapeutics, New York, 1941.
2. Quoted by Goodman and Gilman (ref. 1).
3. Dowling, G. B., Thomas, E. W. P. *Lancet*, 1946, i, 919.
4. Charpy, M. J. *Ibid*, p. 400.
5. Winner, A. L., Cooper-Willis, E. S. *Ibid*, 1946, ii, 663.
6. Wright, A. E. *Ibid*, 1897, i, 303.
7. Hallam, R. *Med. Pr.* 1930, **180**, 408.
8. Percival, G. H., Stewart, C. P. *Brit. J. Derm.* 1924, **39**, 144.
9. Phelan, J. J. *Lancet*, 1947, i, 160.
10. Johnson, R. E. *Ibid*, p. 160.
11. Dowling, G. B. *Ibid*, 1946, i, 590.
12. Bicknell, F. *Ibid*, p, 717.

but it is probable that no-one who is not suffering from vitamin-D deficiency can take large amounts for several weeks without suffering some degree of temporary or permanent renal damage. Hence it is inadvisable to give a patient a prescription for calciferol and allow him to use it at his own discretion. If he gives himself several courses of treatment during a succession of winters he may require advice for symptoms far more serious than those of chilblains.

A SOCIAL RESEARCH COUNCIL?

LAST Saturday the Association of Scientific Workers met in London to consider a memorandum on the furtherance of the social sciences. Just over a year ago the Clapham Committee, which had been asked "whether additional provision is necessary for research into social and economic questions," recommended [1] the establishment of (1) a standing interdepartmental Economic and Social Research Committee, and (2) a subcommittee of the University Grants Committee to advise and foster the social sciences within the universities. The association agrees with both suggestions, but also favours the proposal made two or three years ago for the formation of an official Social Research Council, comparable with the Medical Research Council and others concerned with the physical and biological sciences. The Clapham Committee turned this proposal down: (1) because the chief needs of the social sciences are the strengthening of staffs and provision for routine research; (2) because at the present stage of the social sciences an official body might promote crystallisation of spurious orthodoxies; and (3) because the best men must not be diverted from active research to the coördination of research. The association does not dispute that staffs are insufficient, but it holds that in the scramble for trained personnel no unofficial body could adjudicate between the claims of Government and other research establishments. It rebuts the Clapham Committee's contention that existing research councils have never assisted, and are not suited to assist, research carried out as a normal routine function. Many sciences, it says, have fallen into spurious orthodoxies, irrespective of control by official bodies, and the key to safety lies in untrammelled discussion among workers. The danger that the best men may be diverted to duties of coördination is overshadowed, in the association's view, by the need to prevent overlap and to fill the most important gaps.

The association thinks that the Clapham Committee greatly underestimated the importance of increasing social research; and it wants to see teams formed to examine the factual background of social problems and to collaborate with the people who have to carry out social policies.

DICOUMAROL IN CORONARY THROMBOSIS

INCREASING evidence of the value of anticoagulant therapy in the treatment of coronary thrombosis is forthcoming from America. A recent report from the Mayo Clinic is based on a series of 50 cases of acute myocardial infarction admitted to hospital within a few days of onset.[2] In 40 cases dicoumarol was used alone, while in the remainder heparin was also given. The plan of dosage was that recommended by Barker et al.,[3] wherein the aim is to keep the prothrombin level between 10% and 30% of normal. This was achieved by giving 300 mg. of dicoumarol on the first day, and 200 mg. on the second. On each succeeding day that the prothrombin level was greater than 20% of normal 200 mg. was given in a single dose. If the prothrombin level was less than 20% of normal, no dicoumarol was given on that particular day. While an immediate anticoagulant effect is obtained with heparin, there is a lag of 36–48 hours with dicoumarol. The only complications encountered were 1 case of spontaneous hæmorrhage into the knee-joint, which cleared completely, and 1 mild epistaxis; and microscopic hæmaturia was noted in 1 case. The importance of daily estimations of the prothrombin-time is indicated by the finding that in 12 cases the prothrombin level fell to less than 10%, and in 6 of these the intravenous administration of menadione bisulphite was necessary, while in 6 cases the level rose to above 30% for a few days and during this time a second myocardial infarct occurred in one of the patients.

In assessing the results of treatment a series from the same clinic reported by Nay and Barnes [4] was used as a control: of 100 consecutive cases of acute myocardial infarction, in which anticoagulant therapy was not attempted, thrombo-embolic complications ensued in 37%. In contrast to this, in Parker and Barker's 50 cases, treated with anticoagulants, there were only 2 instances of secondary thrombo-embolic complications. Even more interesting is the observation that in the 2 cases that came to necropsy neither pulmonary emboli nor mural cardiac thrombi were present, whereas pulmonary emboli were found in 5, and mural thrombi in 7, of the 11 cases which came to necropsy in the control series. The mortality-rate was not appreciably different in the two series: 10% in the patients receiving anticoagulant therapy and 13% in the control series. The Mayo Clinic report supports the impression from earlier accounts that dicoumarol is useful in the treatment of myocardial infarction.

THE NATIONAL HEARING-AID

IN response to a request by the Ministry of Health, the Medical Research Council appointed, at the beginning of 1944, a committee on electro-acoustics [5] to design a single type of electrically operated hearing-aid, and to determine specifications for pure-tone audiometers. The committee's design for an aid has already been approved by the Ministry of Health; and under the National Health Service this is to be issued free of charge to those found, after examination at special centres, to be in need of it.

In a report published this week,[6] the committee describe the investigations which preceded their choice of prototypes. Intelligibility for speech was regarded as the real measure of success; and theoretical consideration indicated that maximum speech intelligibility need not necessarily result from matching the amplification provided by the aid to the hearing loss of the user. This view was confirmed by practical work at Manchester University and at the National Hospital, Queen Square, London; and it was concluded that, while effective amplification must be provided for all sounds within the $3^1/_2$-octave range needed for good reproduction of speech, this amplification should increase smoothly with increasing pitch over the lower part of the range, and then either continue to increase at a slower rate or remain constant for the middle and higher-pitched sounds. Piezo-electric microphones were considered to be the

1. Report of the Committee on the Provision for Social and Economic Research. (Chairman: the late Sir John Clapham.) Cmd. 6868. H.M. Stationery Office. 1946.
2. Parker, R. L., Barker, N. W. *Proc. Mayo Clin.* 1947, **22**, 185.
3. Barker, N. W., Cromer, H. E., Hurn, M., Waugh, J. M. *Surgery*, 1945, **17**, 207.
4. Nay, R. M., Barnes, A. R. *Amer. Heart J.* 1945, **30**, 65.
5. The members are: W. G. RADLEY, C.B.E., B.SC., PH.D., M.I.E.E., controller of research, Engineering Department, General Post Office (chairman); Sir LAWRENCE BRAGG, O.B.E., M.C., M.A., D.SC., F.R.S., Cavendish professor of experimental physics, University of Cambridge; R. S. DADSON, M.A., National Physical Laboratory; C. S. HALLPIKE, M.B., F.R.C.P., F.R.C.S., Medical Research Council; Colonel D. McMILLAN, O.B.E., B.SC., A.M.I.E.E., Post Office Engineering Research Station; L. C. POCOCK, M.SC., A.M.I.E.E., Standard Telephones & Cables Ltd.; and T. S. LITTLER, M.SC., PH.D., University of Manchester (secretary).
6. Hearing Aids and Audiometers. *Spec. Rep. Ser. med. Res. Coun., Lond.* no. 261. H.M. Stationery Office. 1947. Pp. 71. 1*s.* 3*d.*

most suitable; and a crystal microphone with a metal diaphragm was recommended as being stable under varying atmospheric conditions and as giving the required performance. Small crystal insert receivers are given a word of special commendation, but the committee's aid is designed for both this type and the earcap type. The receiver with a flat earcap advocated in the report is a modification of a miniature unit developed originally for the Fighting Forces; it weighs about an ounce. The battery replacement cost, according to the report, is about 1·1*d.* per hour of actual use with the external receiver type of aid; while with the insert receiver aid the running cost is about 0·6*d.* per hour.

FUMIGATION WITH METHYL BROMIDE

METHYL bromide is mainly used as a refrigerant, as a fire-extinguisher, and as a methylating agent. Recently it has become popular as a fumigant of ships, warehouses, and other premises to control insect pests, and in this connexion fatalities and poisonings have been reported. The chemical being highly toxic to human beings as well as to insects, the Home Office has issued a useful pamphlet[1] on the risks and precautionary measures.

Methyl bromide boils at a low temperature (4·5°C) and it is therefore usually distributed under slight pressure in cylinders containing the liquid, contact with which may cause severe blistering. Clothing contaminated with the liquid should instantly be removed because a high concentration of gas can arise from it. The gas is heavier than air and has greater powers of penetration through walls and sealing material than other common fumigants such as hydrogen cyanide or ethylene oxide. Deaths have resulted both from exposure to high concentrations of the gas and also from continued exposure to low concentrations. The gas is insidious because it has only a faint odour and also because the symptoms after exposure may be delayed for a day or more. The symptoms of poisoning are mainly referable to the nervous system and include headache, dizziness, diplopia, vomiting, and lethargy, with later convulsions and collapse.

The precautions taken should be at least as rigid as those taken when HCN is used, and it is recommended that a pungent lacrimatory gas such as chloropicrin (5%) should be added to methyl bromide so that its presence in the air can easily be detected.

In addition, all apparatus used for the delivery of methyl bromide gas into rooms should be tested before being used in practical operations. The halide detector lamp is recommended for detecting low concentrations of methyl bromide in the atmosphere. These lamps vary in sensitivity to the gas, some types probably not being sensitive enough to detect 17 parts per million of methyl bromide, the figure given as the upper limit of safe concentration. Advice on suitable types can be obtained from the director of the Pest Infestation Laboratory at Slough. It is desirable that the people carrying out fumigation operations should be given practical demonstrations of the performance of the lamps in known concentrations of methyl bromide. The lamps should be used to detect leaks at the time of fumigation, during the exposure period, and before a clearance certificate is issued.

Each operator or other person entering the space under fumigation must be provided with a protective apparatus of proved efficiency against methyl bromide. In high concentrations of the gas a self-contained (oxygen-generating) or a positive-pressure air-breathing apparatus is necessary, but in low concentrations canister respirators of an appropriate type may be used.

Before fumigation, rooms and other spaces should be sealed with an impervious material which should be of an even higher standard than for fumigations by HCN or ethylene oxide. All rooms, compartments, and alleyways with walls common to those of the area to be fumigated should be evacuated, and warning notices should be affixed. Fumigation staffs should consist of at least two persons, and one of them at least should be in attendance throughout the fumigation and airing period. Both persons should have adequate colour-vision and should be trained in the use of protective and detector apparatus and in first-aid. The dose of methyl bromide should be injected from cylinders placed outside the fumigation area. Airing should be conducted and concluded before the entry of any person other than the operators, who should work in pairs and wear their respirators until tests show that the concentration of gas is a safe one. At this stage a preliminary certificate of clearance is to be issued and the fumigated area closed again for a period to guard against the risk of dangerous quantities of gas being subsequently evolved from absorbent material. A final certificate of clearance should not be given until thorough tests have been made. Ships should never be fumigated until all persons have been taken off, and special care should be taken to test the air in the holds before a clearance certificate is issued.

1. Fumigation with Methyl Bromide. H.M. Stationery Office. June, 1947. Pp. 8. 2*d.*

TELEVISION IN SURGICAL OPERATIONS

LAST February surgical operations were televised for the first time at the Johns Hopkins Hospital, Baltimore.[1] One camera was fixed 4½ ft. above the operating-table, and the image was so sharp that the numbers on a dollar bill placed on the table could be clearly read on the projection screens. A second camera was installed in the gallery to give a general view of the theatre; and the surgeon provided a running commentary through a microphone. The experiment is said to have proved conclusively that demonstration of operations to a group of more than three or four is best effected by television, even though, for the moment, reproduction is only in black-and-white.

BRITAIN'S HEALTH

THE results of the medical examination of men and women called to the colours in 1939–46 are summarised in a report from the Ministry of Labour and National Service.[2] It will be remembered that grades I and II were deemed fit for military service, while grades III and IV were not. Grade IIa consisted of those who, though fit for service, were handicapped by defects of visual acuity or by deformity of the feet. Of the 3,240,906 youths under 21, 91% fell into grades I and II, and 9% into grades III and IV; and of the age-group 21–25 (1,085,908 men) 85% were fit and 15% unfit. At ages 26–35 (2,045,480 men) the percentages were 79 and 21, and at 36–45 (805,480 men) they were 65 and 35. One should be careful in using these figures as a basis for conclusions about the health of the country as a whole, for the scale is heavily weighted at the younger end, where one would expect to find the majority in good health. It is perhaps encouraging, however, that of the relatively few men over the age of 36 the proportion adjudged fit for service was as high as 65%.

Women examined numbered 550,486—less than a tenth of the total of men. They were volunteers in the sense that they preferred joining the Forces to entering industry, and as might therefore be expected they had a rather better health bill than the men, though the difference in the proportions accepted and those refused was not great. Among the men eye trouble and foot trouble were about equally prevalent, but in the women deformities of the feet were noted nearly five times as often as defects in visual acuity.

1. Trimble, I. R., Reese, F. M. *Bull. Johns Hopk. Hosp.* 1947, **81**, 186.
2. Report of the Ministry for 1939–46. Cmd. 7225. H.M. Stationery Office. Pp. 394. 7*s.*

THAT COLD VIRUS AGAIN

THE common-cold virus, against which hostilities were for some years suspended, is now the object of a determined search by several groups of laboratory workers in different countries. At Harvard Hospital, Salisbury, the scientific staff of the Medical Research Council is making investigations with the aid of human volunteers.[1] Another group of workers, this time in the University of Texas, has recently recorded observations likewise based on that susceptible animal—the human volunteer. Pollard and Caplovitz [2] inoculated nasal washings from several cases of common cold into the chorio-allantoic cavity of 7-day-old developing chick embryos and passaged the allantoic fluids at 4-day intervals in further embryos by the same route. Bacterial growth was checked by addition of penicillin to the garglings, and the allantoic fluids were tested periodically by intranasal inoculation into human volunteers. The first "strain" gave negative results with materials from the 2nd passage, the second was infectious for 2 passages but gave mild or negative reactions with 3rd or later passages, and the third "strain" (Spill) induced coryza-like symptoms after 9, 11, and 12 consecutive chick passages. The authors noted that the later passages of this strain induced milder symptoms than the earlier ones: indeed the reactions recorded with 11th and 12th passage material seemed to have scarcely any resemblance to the common cold, though five of the six individuals inoculated with material of the 9th passage might claim that their symptoms of stuffy nose, sneezing, and nasal discharge were equivalent to the natural disease. This part of the report seems convincing enough, though the absence of control volunteers makes the significance of the conclusions uncertain. We are next told, however, that six volunteers were inoculated intranasally with allantoic fluid of the Spill strain in its 9th chick passage, and that five developed colds. These five, together with five new volunteers, were inoculated subcutaneously, at weekly intervals, with two doses of infectious allantoic fluid of the same strain; and one week after the second inoculation they and two control uninoculated subjects received an "immunity test" by the intranasal inoculation of a Seitz-filtered pool of nasal washings from naturally acquired cases of common cold. Only the two "controls" developed symptoms.

Pollard and Caplovitz rightly refrain from commenting on their observations or from making any deductions; for an experiment as important as this might be must certainly be supported by better evidence before it can be accepted at its face value. No virus worker would place much reliance on an observation based on results in ten immunised animals compared with those in two controls. Moreover, the material used for the immunity test was a Seitz filtrate, though the previous cultivation work was based on unfiltered garglings. Finally, of the two control subjects, only one had symptoms severe enough to be classed as a cold for more than twenty-four hours. Much as one would like to welcome these experiments as promising better times in the prevention of the common cold, it cannot be said that they do more than indicate a repetition with more stringent controls. Perhaps it would be as well to add: "Over to you, Salisbury!"

1. See *Lancet*, 1946, i, 680.
2. Pollard, M., Caplovitz, C. D. *Science*, 1947, **106**, 243.

MEETING THE MINISTER

ON Dec. 2 and 3 the Negotiating Committee will meet the Minister of Health and hear his response to the argued case they have placed before him. The profession has not yet been informed of the arguments advanced on its behalf, though Dr. Dain has reiterated his opinion that an amending Act is necessary. In difficult circumstances we trust that both sides will nevertheless aim at a reconciliation of views, enabling doctors to enter the service with a degree of good will which has not yet been encouraged to develop.

To

SIR CHARLES SHERRINGTON, O.M.

On his 90th birthday, November 27, 1947

Man shapes the patterns of his mind
As models of the world without,
But to himself he long was blind
And found no answer to his doubt.

You first within the brain discerned
The meaning of its ordered ways,
And man of his own nature learned
To thread the labyrinthine maze.

Poet, you saw the vibrant nerves
Subdued to metrical control,
By which each one in rhythm serves
The guiding purpose of the whole.

These lines a homelier homage bring
Than all the laurels time has brought—
A wish as birthday offering
From world-wide children of your thought.

May age, which clouds the body's eye,
Still leave undimmed the inward sight
That reads life's secret poetry
With timeless wonder and delight!

W. RUSSELL BRAIN

Special Articles

GERIATRIC REHABILITATION *

L. Z. COSIN
F.R.C.S.
MEDICAL SUPERINTENDENT, ORSETT LODGE HOSPITAL, ESSEX COUNTY COUNCIL

NURSES to attend the aged sick are very scarce, and likely to remain so. It therefore behoves us to diminish the number of aged patients needing much nursing care. This can be achieved by geriatric rehabilitation.

For many patients over sixty years of age progressive deterioration is inevitable, but others may be expected to improve—rapidly or slowly. With an active approach to the problem more and more can receive treatment in bed preparatory to the restoration of assisted or unassisted ambulation. By including this method of treatment at Orsett Lodge Hospital during a recent two-year period, we found that of 780 patients over the age of sixty 45% were rehabilitated, while 35% died and only 10% remained bedfast after six months. (Transfers and more recent admissions account for the remainder.)

AIMS AND METHODS

During the late war we saw how the group encouragement provided in rehabilitation units of the Armed Forces and industry accelerated individual recovery. In these units there were facilities for occupational therapy, physiotherapy, and remedial exercises, with a cheerful and happy environment. This solution suggests that every patient of whatever age and disease needs a hopeful environment for his well-being or recovery; without it convalescence is delayed or deferred indefinitely.

The chief factor in geriatric rehabilitation is the visible improvement of other patients similarly incapacitated, while efficient medical and surgical care are very important subsidiaries. The rehabilitation of our aged patients must begin on admission to hospital, so that the physical and mental deterioration induced by long-continued recumbency does not take place. Tacit acceptance of a poor prognosis—not always accurate—has been responsible for many avoidable deaths from pulmonary embolism in the bedfast.

The aim of geriatric rehabilitation is to restore the maximum degree of painless movement by means of active physiotherapy and remedial exercises, resulting in the maximum of personal independence; we can no longer be satisfied with merely removing pain. If the patient reaches a stage of weight-bearing, assisted or unassisted, so much the better. Utilising simple physiotherapy for a sufficiently long period the proportion of patients who are bedfast can be dramatically reduced. No longer do we label our patients irremediable, incurable, chronic, or senile; instead we make a prognosis based both on diagnosis and on an assessment of the particular person's physical capacities. We recognise that deterioration inevitably accompanies certain irremediable diseases, and that a time must come when the patient will have to remain in bed throughout the 24 hours; but it is surprising how long this point can be postponed. Many patients with advanced malignant disease are happier and complain less of pain when encouraged to get out of bed for a part of each day to help themselves. With few exceptions, in which I include the final inevitable deterioration, the inability of a permanently bedfast patient to feed and generally look after himself is to be regarded as a medical reproach.

FOUR CATEGORIES

Using this method we can recognise that most aged patients fall into certain broad categories.

1. Those patients who cannot provide their own feeding and residential arrangements but are otherwise fully competent to attend to their own needs. They feed themselves, dress themselves, and help about the ward. They require no night attention, are continent, and are capable of completing light occupational tasks.

2. The frail ambulant who is in need of increased periods of rest but can usually cope for himself. (I am adopting the provocative attitude of including among these a large proportion of cases of senile dementia and cerebral arteriosclerosis; for the criterion of bedfastness should be a sufficient physical disability—a condition not obvious in most of these patients.)

These two categories need minimal nursing supervision and extra physical help, for which ward orderlies can be employed. Many of those in the first group should not be in an institution at all if they could be provided with suitable homes.

3. The physically disabled bedfast patient who feeds himself, generally looks after himself, and may be continent. This class of patient does not make a very heavy call upon our nursing service, and we should aim at reabling our bedfast patients into this group.

4. The physically disabled permanently bedfast patient who needs every nursing care and attention. In my opinion the number in this category, swollen by previous medical neglect, should and could be much reduced.

A good medical, surgical, and nursing service alone will not reduce the proportion of bedfast patients to a minimum unless it embodies the principle of geriatric rehabilitation. In these days of rapid social change the revolt against recumbency must be made successful.

* Read before the International Conference of Physicians in London, September, 1947.

DYNAMICS OF THE CEREBROSPINAL FLUID

IN a Honyman Gillespie lecture in Edinburgh on Nov. 13, Dr. E. A. CARMICHAEL (London) said that the original conception of Munro and Kelly of the craniovertebral system as a closed and rigid container had had to be modified in the light of the observed fluctuations in pressure of the cerebrospinal fluid (C.S.F.). Dr. Carmichael and his associates had thought it necessary to examine the parts played by the various elastic or possibly elastic structures—the arteries, veins, and capillaries, and the meninges—in allowing fluctuations in pressure.

Manometric observations were made, mainly on subjects in the erect posture. In most the pressure in the lumbar sac was equal to the distance between the needle and the cisterna magna. Jugular compression did not affect the increase in the lumbar pressure on change from recumbent to erect posture. Thus distension of cranial veins is not itself the factor producing the lumbar pressure in the erect position. Abdominal compression increases the lumbar fluid-pressure in the recumbent subject, but if the subject is raised to the erect posture abdominal compression does not cause further increase. The lumbar fluid-pressure appears to reflect the pressure in the lumbar veins. In a patient with a spinal tumour in the lower cervical region which caused complete subarachnoid block, abdominal compression with the subject in the recumbent posture raised the pressure in the lumbar sac to the level of the cistern—i.e., above the level of the block—and the same change was found in the erect posture. In other words the patient reacted in the same way as the normal subject. The hypothesis that the rise in lumbar pressure in the erect posture is associated with dural collapse in the cervical region and distension in the lumbar region was thus refuted; the rise is rather to be attributed to change in pressure in the lumbar veins.

A series of studies was made of the spontaneous fluctuations in intracranial pressure in patients with craniotomy openings. Pressure fluctuations take place with respiration; little change is recorded during inspiration, but towards the end of expiration intracranial pressure first rises and then falls. With the subject in

the recumbent posture jugular and arm venous pressures fall during deep inspiration, but in the erect posture the jugular venous pressure does not vary even with deep respiration, and it is evident that variations in intrathoracic pressure during respiration in the erect subject are not transmitted back to the intracranial veins and are not the cause of the fluctuations in intracranial pressure.

In the erect posture both intraventricular pressure and cisternal pressure show a rise during deep inspiration, followed by a pronounced and prolonged fall with expiration. It can be shown that, when a spinal tumour wholly blocks communication between the cistern and the lumbar sac, the respiratory fluctuations in the pressures in these two parts are in opposite directions and must be due to different mechanisms. The changes in the lumbar sac appeared to be in response to pressure changes in the abdominal and lumbar veins, but the pressure changes in the cistern could not be related to changes in intracranial venous pressure. During deep inspiration the systolic arterial pressure rises, and it then falls during expiration. Similarly and at the same time, the cisternal pressure rises and falls. If the subject is agitated by the posing of a difficult arithmetical problem the systolic blood-pressure and the cisternal pressure rise. It was shown that these changes are not due to vasoconstriction or vasodilatation of the cerebral vessels. Furthermore, changes in blood oxygen and carbon-dioxide content, although altering C.S.F. pressure, do not do so rapidly enough to be involved in the fluctuations associated with respiration.

Dr. Carmichael concluded that with the subject in the erect position the fluctuations in the cisternal fluid pressure are due to fluctuations in arterial blood-pressure; but fluctuations in pressure in the lumbar sac are due to changes in venous pressure as influenced by respiration. He contended that the dura is not an elastic structure and that the rise in lumbar pressure with the assumption of the erect posture is not due to cervical dural collapse and lumbar dural distension.

GENERAL MEDICAL COUNCIL

PRESIDENT'S ADDRESS

THE 172nd session opened last Tuesday with an address from the president, Sir HERBERT EASON. He spoke with regret of the death of three former members of the council: Dr. Cecil Wall, Sir Norman Bennett, and Mr. J. A. Woods. The King's Birthday Honours list in June included the names of Prof. J. A. Gunn and Dr. Wilfred Fish, who were appointed C.B.E. Professor Gunn, as an original member since 1928, and chairman since 1939, of the British Pharmacopœia Commission, has long been associated with the council. Dr. Fish has been a member since 1942. The president also congratulated Mr. J. J. Robertson, M.P., a Crown nominee to the council, on his appointment as joint parliamentary under-secretary to the Secretary of State for Scotland. He introduced Mr. C. P. Harvey as legal assessor at the new session.

The President has received from the Home Office a letter calling attention to the number of thefts of dangerous drugs and other poisons from cars left unattended by doctors. The Home Office has pointed out that time would be saved and the public safety increased if all doctors would remove poisons from their cars when unattended, or alternatively would lock their cars.

The President regretted that owing to pressure of other business there is no certain prospect of a draft Bill amending the Medical Acts being considered during the present Parliamentary session. "The short draft Bill submitted by the Council to the Government included not only important provisions based on the recommendations of the Goodenough Committee, but also provisions giving practitioners a right of appeal to the Courts against penal erasure from the Medical Register; giving the Council statutory power, which they do not at present possess, to restore the names of practitioners to the Register after penal erasure; enabling the Council to take evidence on oath and to compel the attendances of witnesses by subpœna; and enlarging the direct representation of the profession on the Council. The enactment of such provisions as these would, I believe, commend itself alike to the profession and to the public."

The council then proceeded to the consideration of other business.

LONDON'S VOLUNTARY HOSPITALS

THE practical interest of the public in the voluntary hospitals of London is again well demonstrated in the Annual Statistical Summary for 1946 just published by King Edward's Hospital Fund for London. The total maintenance income (including all free legacies) of the 161 hospitals reached a record figure of £7,360,000. In addition, £195,000 was given for endowment, and £287,000 for building and equipment, making a grand total of £7,842,000—£363,000 more than in 1945 and £2,117,000 more than in 1938, the last complete pre-war year. Income from subscriptions and donations rose by £91,000 to £1,364,000 (1938, £1,091,000); patients' contributions by £224,000 to £1,343,000 (1938, £1,021,000); and contributory schemes by £49,000 to £961,000 (1938, £689,000). Legacies produced £551,000, compared with £676,000 in 1945 and £595,000 in 1938.

Ordinary income amounted to £6,809,000, which was obtained from the following sources: public authorities (25·7%); subscriptions and donations (20%); contributory schemes (14·1%); investment property (10·9%); ordinary patients (9·9%); pay patients (9·8%); central funds (5·2%); fees, &c. (4·4%). Maintenance expenditure amounted to £8,666,000—£2,193,000 more than in 1945 and £3,717,000 more than in 1938—leaving a deficit (after the inclusion of free legacies) of £1,306,000. In 1945 there was a surplus of £410,000, and in 1938 a deficit of £140,000.

A considerable increase over the previous year in the volume of work is recorded. The number of new inpatients rose from 237,000 in 1945 to 266,000 in 1946 (1938, 308,000), and the average number of beds occupied daily from 12,881 to 13,713 (1938, 16,211). New outpatients totalled 1,858,000, compared with 1,635,000 in 1945 and 2,042,000 in 1938, and outpatient attendances 8,925,000, compared with 7,872,000 in 1945 and 10,343,000 in 1938. The summary reflects the enormous increase in the cost of hospital service. In 1938 the average cost of a bed was £233 per annum: in 1946 it was £490, an increase of 110·3%. The average cost per 1000 outpatient attendances in 1938 was £110: in 1946 it was £209, an increase of 90%.

SHORT FORM OF BIRTH CERTIFICATE

A NEW and short form of birth certificate, showing only name and surname, sex, date of birth, and (where possible) place of birth, will be obtainable at a cost of 6d. from Monday, Dec. 15. In the case of births registered in England and Wales application may be made to the superintendent registrar of the district in which the birth took place, or to the General Register Office, Somerset House, London, W.C.2. A short certificate may also be obtained from the local registrar at the time of registration of the birth. Where births have been registered abroad and entered in Army, Air Force, Consular, or Marine records deposited with the Registrar-General, certificates may be had only from the General Register Office; and this applies also to certificates relating to adopted children.

The effect of the new certificate is to remove the disability imposed on those of illegitimate birth, who have hitherto had to submit the full certificate, with details of parentage, when required to establish the date of their birth.

In England Now

A Running Commentary by Peripatetic Correspondents

NOTHING could have been less peripatetic than your correspondent between 6.30 A.M. and 12.30 P.M. on Thursday last week as he stood immobile with his solar plexus pressed against an iron rail and his other sides compressed by a solid mass of humanity.

I had come, more or less straight, from a decidedly wet celebration at "the local" of my ship's defeat at both soccer and darts by a sister ship, and had arrived at about 12.30 A.M., when things were still quite lively in the Strand and Square. One could sustain life at the coffee-stalls or on chestnuts, tomatoes, grapes, or even ice-cream. Already the kerbs were strewn with forms in every conceivable attitude of uncomfortable sleep. An enterprising merchant was selling bits of sacking at a bob to keep the chill off. I relied on newspaper as an antihæmorrhoidal and antirheumatic, and between rather frequent visits to the station dozed fitfully with my back against a stanchion.

Between 2 A.M. and 5 things were comparatively quiet, but long before dawn there was a mysterious, incessant twittering, and, as the sky paled, flocks of innumerable starlings swept across the Square, from which the pigeons were entirely ousted by the gradually increasing crowds.

At about 6 I took up my stance on the rails. In my immediate neighbourhood were a most voluble Irishwoman, who persistently cajoled the police with sweets, two ladies in heavy furs, another suffering from a thick leather jacket and pediculosis capitis fulminans, and several children with impetigo very contagiosum.

With the ever-increasing pressure came the faintings, fast and furious. Of the two methods of extrication the Compression Method seemed better on the whole than the Elevation. In the former the patient was forcibly squeezed through the seemingly incompressible mass, and, after being bent double under the rails, emerged flushed and breathless. In the latter they were somehow hoisted above the heads of the crowd and rolled by hand to the St. John's men at the perimeter. I imagine their chief concern was the loss of valuables.

In my vicinity at any rate the B.R.C. was conspicuous by its absence, but St. John had never a dull moment and had even to rope in Scouts as stretcher-bearers.

Maybe this pandemic of syncope was partly due to faulty nutrition. Could it possibly have been aggravated by the surprisingly lugubrious music of the Royal Marine band, whose only inspiration was "O, what a beautiful morning!"? Occasionally one had the impression that the diagnosis might have been feigning rather than fainting, so rapid was recovery when a better view seemed probable. Other opportunists were certainly not slow to take advantage of any disturbance of the mass.

But on the whole the temperament was of a warm-hearted, give-and-take character. I saw a tallish man try really hard to comply with the persistent entreaties from the rear to make himself smaller. I, even I, compressed myself to such an extent as almost to suffer the lamentable fate of Judas I.

As to the pageant itself, in the oft-reiterated phrase of some girls behind me, "It was luv-ly—ain't she luv-ly." And was it worth the effort? Yes, a thousand times yes. But what psychological motivation prompted one to the experience or was satisfied thereby 'twould not be easy to say.

* * *

I have just had my first experience of general practice, and the humour and friendliness of my Welsh patients struck me very much. I found there were two predominant reactions to my arrival: the curious majority said, "Let's go and see what he's like; maybe *he*'ll cure us," whereas the cautious minority said, "Let's wait till our own doctor comes back." The strongest supporter of class II was the wifey who asked for Dr. X at the surgery and on being told about me announced with feeling, "I'm not seeing *him*"; and neither she did. I was surprised at the range of cases one sees in a short time—medical, surgical, eyes, ears, noses, throats, fevers, sick kids, and the biggest group of all, those up for "sustifickits."

The people appeared to appreciate being chatted with, about this, that, and the others, and if a G.P. had sufficient time I'm sure he would get much interest out of his patients. There was the lad who, on being asked about his work, replied, "I don't work, I'm a student." And the old lady, almost totally bedridden for eleven years, who got some excitement whenever Dr. X's holiday came round by thinking to herself "I wonder what this year's locum will be like." I felt sorry for the man who had waited patiently for an hour in the crowded surgery when his wife phoned: "Is my husband there? Send him home immediately, and tell him to bring the cat with him." So off he went, with the cat still tucked inside his jacket. I don't know whether I was to have seen him or the cat. And lastly the doctor's small son. He was very worried about how I was to go on my rounds, for I had no car of my own. He asked the dispenser, tearfully, with his slight lisp: "The new doctor ithn't going to uthe my new thcooter, ith he?"

* * *

For many years I have done what little I could to curb the use of abbreviations by my students. But I had no idea how far this pernicious habit had spread until I encountered Cecily C. Matthews's new *Dictionary of Abbreviations*.

I am still awaiting the reactions of my friends among the officials of the Royal Society of Medicine (not to be confused with Regimental Sergeant-Major, Royal School of Mines, or Royal Scottish Museum) to the entry "F.R.S.M. Fellow of the Royal Society of Medicine." Fellows of the Royal Society will be interested to learn that their distinguished initials are claimed by "Federal Reserve System (U.S.A.); Friends' Relief Service; Fuel Research Station," but they may be somewhat disconcerted by the entry "F.R.S. (L.) Fellow of the Royal Society (London)." Their distinguished president shares honours with "Performing Right Society; Proportional Representation Society; Protestant Reformation Society." I had always recognised that my M.D. was a stock abbreviation in the psychiatric world, but I had never appreciated its many other uses: "Managing Director; Market Day; 'Medicine and Duty'; Memorandum of Deposit; Mess Deck; Message-Dropping (R.A.F.); Metropolitan District (rly.); Metrology Department; Middle Dutch; Military District; Mine Depot (nav.); Monroe Doctrine"! The B.M.'s among us score heavily compared with the mere M.B.'s: "*balneum marinum* (sea-water bath—med.); Beach Master (R.A.F.); *Beata Maria* (Blessed Mary); *Beatæ Memoriæ* (of blessed memory—Lat.); bench mark; bending moment; Bishop and Martyr; breech mechanism; Brigade Major; British Museum; Bronze Medallist; Brotherhood Movement; Burgomaster." Our friends in Tavistock Square are paired off with the Bobbin Makers' Association and British Marine Aircraft.

I had never realised what a wonderful collection of letters our dental colleagues could possess, and I give them full marks for modestly abbreviating their L.D.S. R.C.S. Eng. to a mere L.D.S. For length combined with variety, however, they must be prepared to give way to some of the trade-unions. What, for instance, could be better than Z.C.R.G.S.M.W.S.? which I leave you to interpret for yourself.

* * *

These new-fangled terminologies are very confusing to old fogies like ourselves. The other day I asked the resident anæsthetist what he had given the patient. "Seven point five millilitres of soluble thiopentone" was the astounding answer. I suppose he saw I was startled, for he asked me if I didn't approve of the International System of Weights and Measures. "If you mean the metric system, why not say so?" I retorted peevishly. He was horrified—"But, sir, the metre is a hopeless standard of length, it is supposed to be a certain fraction of the circumference of the earth as calculated. . . ." "Oh, all right," I said wearily, "let it go."

It rather looks as if our light literature will read like this in future.

That night matters came to a head at the inn. Tom, who had drunk not wisely but too well, spied Dave as he sauntered up to the bar. Heaving his 15 stone (95·45 kg.) off his stool, he flung a pint (568 ml.) of liquor into his face with every ounce (28·4 g.) of his strength. Spluttering with rage and beer, Dave grabbed his heavy riding whip and roared: "You scoundrel, I'll thrash you within an inch (2·54 cm.) of your life."

Letters to the Editor

PENICILLIN IN CASES OF CLOSED ORAL SEPSIS

SIR,—In the past, many teeth have been sacrificed on the altar of systemic disease. Though of recent years more balanced judgments have prevailed, I feel that, with the use of penicillin, the pendulum is tending to swing too far in the opposite direction.

Penicillin does not influence the growth of organisms in areas which have little or no blood-supply. The cases recorded below show that penicillin-sensitive organisms can thrive in a dead tooth pulp, or even in an apical dental granuloma, while a patient is undergoing treatment with massive doses of systemic penicillin. The importance of this in diseases such as bacterial endocarditis and metastatic osteomyelitis cannot be too strongly emphasised. It seems in many such cases that relapse after penicillin therapy is due to "a bacterial leak" from an infected tooth, or possibly tonsil, after the penicillin has been discontinued.

CASE 1.—*Osteomyelitis of rib.* Blood-culture gave *Staph. aureus.* Penicillin 2,700,000 units was given in twenty-seven days. Then two infected incisor teeth were removed. Cultures from the pulp of one of these teeth yielded a fully penicillin-sensitive *Staph. aureus.*

CASE 2.—*Septic arthritis of both sacro-iliac joints, with multiple sinus formation.* Three years' history. Cultures yielded a staphylococcus and a hæmolytic streptococcus. The patient was given penicillin 48,000,000 units, in three courses over a period of twelve months. A dead upper molar was extracted during the last week of the third course. Organisms cultured from the pulp yielded a staphylococcus and a *Strep. viridans,* both of them penicillin-sensitive. A week later the sinuses were dry. Six months later they are still dry and the patient is back at work.

CASE 3.—*Bacterial endocarditis.* Penicillin 25,000,000 units was given in twenty-five days. Then an upper premolar was extracted. Cultures from the centre of an apical granuloma yielded a scanty growth of *Strep. viridans,* fully penicillin-sensitive.

The penicillin was continued for a further seven days, and the patient was discharged from hospital shortly afterwards. Four months later she is awaiting admission to hospital for further dental extractions, for cosmetic reasons, under a penicillin "umbrella."

CASE 4.—*Dental abscess,* which had been treated with penicillin 100,000 units a day for three days. When I first saw the patient on extraction, cultures of the pus were sterile, but those from the tooth pulp yielded *Strep. viridans* and a few *Staph. albus* and diphtheroids, all fully penicillin-sensitive. The diphtheroids were probably contaminants.

Numbers of "sterile" reports were received on cultures from teeth roots in similar cases. Not a few of these were probably due to excessive zeal in the flaming of the outer surface of granulomata before dividing them for culturing from their centre. The proportion of sterile findings and positive ones was about equally divided.

I wish to thank Dr. E. T. Baker-Bates, Dr. C. Astley Clarke, and Mr. J. P. Heron, who have given me every assistance with their cases; and Dr. W. K. Taylor for his invaluable bacteriological work.

Liverpool. JOHN W. HALLAM.

TUBOCURARINE IN TETANUS

SIR,—The use of curare in the treatment of tetanus was suggested nearly seventy years ago, and in 1934 and 1935 Cole [1] reported cases in which it was employed with some success. The difficulty encountered at that time was the lack of standardised preparations, and therefore the establishment of a suitable dose was impossible. Further, there is only a narrow margin between the dose which will be effective in controlling the spasms and that which will affect seriously the respiratory muscles.

The introduction of tubocurarine and the wide experience gained in its use as an adjuvant to anæsthesia prompted its administration in a recent case. Although this case ultimately proved fatal, the injections of tubocurarine produced symptomatic improvement and were much appreciated by the patient, who repeatedly asked for them when the next dose was due.

The opportunities of treating tetanus in London are rare, and the purpose of this note is to indicate the dose of tubocurarine which was found satisfactory. The patient was a woman, aged 38, having an estimated body-weight of 7 st. Tubocurarine chloride 7·5 mg. by intramuscular injection every two hours produced maximum muscular relaxation without having any apparent effect on the respiratory mechanism.

Other features of interest in this case were that the patient had cut her finger in a hop-field one week before admission to hospital. The first symptoms, observed four days after the cut, were nasal regurgitation of fluid and difficulty in swallowing when having lunch. These symptoms were predominant throughout the duration of the condition, and the accumulation of saliva and mucous secretion in the mouth and pharynx was very troublesome. On the other hand, although there was considerable muscular rigidity, the spasms were relatively mild and infrequent and caused little evidence of exhaustion.

During the eleven days the patient survived in hospital it was impossible to administer any fluid or nourishment by mouth, but in spite of this there was no dehydration. The general condition was well maintained by the continuous intravenous infusion (great saphenous vein above the internal malleolus) of 5% glucose in $^1/_6$th normal saline, 2500 ml. every 24 hours. Heparin 10 mg. was added to each 1000 ml. Large doses of tetanus antitoxin (total 573,000 units) and penicillin (total 1,710,000 units) were administered in the drip infusion. As a sedative, paraldehyde 6 ml. every four hours was given by intramuscular injection.

The fatal termination of this case was attributed to the fact that early bulbar symptoms developed before treatment with antitoxin could be instituted, and in spite of the control of spasms by paraldehyde and tubocurarine.

Mile End Hospital, London, E.1. W. GORDON SEARS.

1. Cole, L. B. *Lancet,* 1934, ii, 475; *Quart. J. Med.* 1935, **4**, 300.

THE HEALTH OF AUTHORS

SIR,—Mr. Harold Nicolson's lecture before the Royal College of Physicians, published in your Nov. 15 issue, was delightful reading—such indeed as one expects from Mr. Nicolson. Its appearance in your journal, too, is a welcome relief from considerations of erythroblastosis fœtalis et al.

In his cogent and lucid exposition of the Nature of Inspiration, Mr. Nicolson defines inspiration as "a sudden flash or fusion between sense and fantasy, between reason and imagination," but he is careful to explain and to illustrate that it may vary in intensity and in degree, producing a physical revolt or reaction on the more acutely sensitive temperaments. And such a temperament is, as he says, most often found in the favoured, or afflicted, of the Muses.

Now Mr. Nicolson confines himself, and rightly, to his own chosen sphere—the art of letters. But so far as his lecture might be taken to imply by omission that the divine afflatus and oneiromancy are the peculiar prerogatives of poets and writers only, I would suggest that precisely similar phenomena have been experienced by mathematicians and scientists *pur sang*—and not without comparable stupendous flowering of result.

Two years ago—up to which time I had myself so wrong a notion—I came across Father Henry Gill's (S.J.) book *Fact and Fiction in Modern Science.* His very first chapter is headed Flashes of Genius, and two mathematicians of international repute, Sir William Rowan Hamilton and Henri Poincaré, are adduced to speak in the matter for themselves. While Father Gill is content to cite two examplars of inspiration, and dream, whose best work was due to such external influence, it may be presumed that they were no exceptions to what after all may be an inherent susceptibility in what some call "the human organism."

It is a commonplace that the practice of medicine is an art rather than a science; but a gathering of our profession may be said to approximate more nearly to a convention of scientists than a galaxy prostrate at the feet of the Muse. It is as scientists that we may find a little reflection salutary, even if Mr. Nicolson

refrained from asking whether we needed an apologia ourselves. At any rate with him we can be that much more on the side of the angels; and free to some extent at least from Sinclair Lewis's gibe when he called us "the men of measured merriment."

Finally, in renewing my thanks to Mr. Nicolson for a most enlivening and invigorating paper, may I take leave to ask him why he omitted mention of Christopher Smart and his *Song to David*? Sublime poetry and stark lunacy here go merrily hand in hand for dozens and dozens of stanzas. Selene and Euterpe may it seems bed together in silver peace. Perhaps someone else will tell us whether Urania sleeps alone? Or her fledglings the psychiatrist and the psychologist?

Cheslyn Hay, Staffordshire. L. DILLON MALONE.

TREATMENT OF BOILS

SIR,—With reference to the letters by Dr. Valentine (Nov. 15) and Dr. Foot (Nov. 1), I wish to say that I have been using systemic penicillin for boils and carbuncles for over nine months.

During the last six weeks alone I have dealt with seventeen patients suffering from boils and carbuncles situated in various parts of the body. The treatment consisted of one injection into the vastus lateralis muscle of 10 ml. oil-wax suspension of penicillin calcium, 125,000 units per ml. They all invariably noticed subsidence of pain and swelling, commencing between four and six hours after the injection, and all were discharged fit for work within 7 days. The reactions were pain radiating down the limb during the injection, followed sometimes by a severe fainting bout. There was stiffness of the injected limb, which lasted up to a fortnight. On the 8th day, in two cases, a gross swelling of the thigh and an itchy erythematous rash developed, which subsided in 3–4 days without any treatment. A few months ago I had two cases of urticarial reaction spreading over the whole body, following penicillin injection; one case I described in THE LANCET of July 5.

One word about local treatment—none. A piece of dry lint or gauze was placed on the discharging area, if any. This was replaced daily if the discharge was profuse. If there was a large sloughing area, a few grains of crystals of urea were sprinkled on daily.

Many of these patients had had previous attacks of boils and carbuncles, usually lasting for weeks, or even months, and these patients were all impressed by the dramatic improvement following the penicillin injection, and also by the absence of local treatment.

During the last six months I have noticed an enormous increase of boils and carbuncles. Next to the common cold, furunculosis has been the most prevalent disease amongst the patients attending my surgery, and I wonder whether other practitioners have had an experience similar to mine.

Sheffield. I. GOTTLIEB.

TYPHOID CARRIERS TREATED WITH PENICILLIN AND SULPHATHIAZOLE

SIR,—We have previously reported observations on two typhoid carriers treated with penicillin and sulphathiazole.[1] A further report is now presented to cover the first year after treatment.

Frequent specimens of early-morning urine and specimens of almost all stools passed were cultured for *Bact. typhosum* on Wilson and Blair's medium, and on desoxycholate agar plates inoculated direct and after incubating a portion of each specimen in selenite F. Many specimens of fæces and urine were also inoculated direct on MacConkey plates. Some 2500 culture plates were examined in each case. *Bact. typhosum* has not been isolated from any specimen. Agglutinations of sera against *Bact. typhosum* H, O, and Vi have also been carried out in both cases.

CASE 1.—This patient died on Nov. 1, 1946, from intercurrent pneumonia followed by lung abscess. Post mortem, there was no evidence in the organs of continuing typhoid infection. Bacteriological cultures from gut, biliary and urinary tracts, spleen, and lungs did not yield *Bact. typhosum*. From the first negative cultures during the course of treatment to death 198 days later, 534 samples from 137 stools and 272 samples of 136 urines did not yield the organism.

Results of serum agglutinations may be summarised as follows: *Bact. typhosum* H, initial titre 1/125 declined to 1/40 on Sept. 27, 1946; *Bact. typhosum* O, initial titre 1/50 rose to a maximum of 1/320 and then fell to 1/160 on Sept. 27, 1946; *Bact. typhosum* Vi was further reduced from the lowest value previously reported (+ in 1/5 dilution) to a trace (±) in 1/5 dilution on Sept. 27, 1946.

CASE 2.—This patient is alive and well, her physical condition being substantially better than before her treatment. During the year following the first negative cultures in the course of treatment bacteriological examination of 491 samples from 146 stools and of 314 samples from 157 urines did not yield *Bact. typhosum*.

Results of serum agglutinations: *Bact. typhosum* H, initial titre 1/500 fell to 1/80 on June 12, 1947; *Bact. typhosum* O, initial titre 1/50 rose to 1/160 and then declined to 1/20 on June 12, 1947; *Bact. typhosum* Vi, titre has remained roughly as previously reported, + being found in 1/5 dilution on June 12, 1947.

These two patients, both of whom before treatment freely excreted *Bact. typhosum* in their fæces, are regarded as having been cured of the typhoid carrier state, as much reliance being placed on the change in agglutination titres as on the negative bacteriological findings. The increase in *Bact. typhosum* O agglutination titre following the decrease in Vi titre observed in these cases has also been observed by one of us (W. W. K.) in one other typhoid carrier successfully treated with penicillin-sulphathiazole. It is hoped to report and discuss these and other agglutination results in detail on some future occasion.

We wish to thank Dr. L. C. Cook, medical superintendent of Bexley Hospital, for his continued interest; and the staff responsible for nursing the patients and our technical staff, in particular Mr. L. W. Tuttle and Mr. C. R. Wright, for their painstaking coöperation.

Bexley (L.C.C.) Hospital. C. H. COMERFORD
H. RICHMOND.*

Epsom Pathological Laboratory (London County Mental Health Services). W. W. KAY.

DEPERSONALISATION SYNDROME

SIR,—I read with interest and concern Dr. Shorvon's article in your issue of Nov. 15.

The cases he quotes in favour of prefrontal leucotomy seem to me not at all convincing. The price his patients have paid for their symptomatic improvement seems to be the loss of an essential human quality. For example, of case 4, a woman of 26, he reports: "Six weeks after the operation her father died suddenly, and she took it in an off-hand manner and was 'surprised.' Her attitude to her brother had completely altered, and she gets on well with him. 'I don't worry about him. I don't worry about anything any more.'"

As regards this brother she had experienced a deep unresolved conflict, for which she received "eight electric convulsion shocks and a course of modified insulin and narcosis without success." Later she "derived no benefit from psychotherapy, vasodilators, vitamins, amphetamine, epanutin, and narco-analysis."

Psychotherapy is often quoted in similar vein: "psychotherapy and a course of deep insulin had little effect."

Psychotherapy is not yet another method of treatment; it is an essential orientation. Depersonalisation is a defensive reaction against an unbearable conflict—problems of the patient's life which he is unable to face. The question is whether we are willing and able to face them with him, or not. This would remain no less true even if we knew the pathology of the depersonalisation syndrome on the somatic level, which we do not. We cannot talk about this condition as attacks which descend upon the patient—e.g., "he felt ill and weak after the onset of unreality," and "the 2 who had recovered immediately had had previous clear-cut attacks of unreality," and so on.

It is true that these cases are difficult to treat successfully, and that even for prolonged psycho-analytic

1. Comerford, C. H., Richmond, H., Kay, W. W. *Lancet*, 1946, ii, 343.

* Dr. Richmond has died since this communication was sent to us.—ED. L.

treatment the prognosis is not too good. The psycho-analysis of such cases is a matter for specially skilled and qualified analysts and requires daily sessions over a period of three years; and it could therefore in any case be obtained only by a very few. If the necessary skill for analysis is present only in a few, this must be even more true for the general run of psychiatrists. Abbreviated treatment is even more difficult and demands even more experience, and it is still too time-consuming under our present conditions. My sympathy goes out to Dr. Shorvon and all harassed colleagues in their race against time and the overwhelming claims of this type of patient, particularly if they appear in numbers. It may well be that such emergency treatment as he reports is inevitable under present conditions. Moreover, it might be the only practicable measure for selected cases with a very unfavourable prognosis.

But this does not alter the fact that these patients are often exceedingly good material for psychological approach, if they are approachable at all; and all those I have seen have proved to be so. Dr. Shorvon's own beautiful quotations bear this out, but one can well believe him that "they have the utmost difficulty in describing their symptoms and in being understood."

In view of all this it seems to me of particular interest to mention that I have seen several such cases in group analysis, and all of them did exceedingly well, and that on genuine grounds. They regained their feelings, developed constructive insight, were able to see and face their problems, and showed self-progressive powers of integration. In short, they left treatment in a better state than they would have been likely to achieve if they had never developed "attacks of unreality." In at least three cases the depersonalisation syndrome was the outstanding feature, but it should be mentioned that they were all above average intelligence. Two of them stayed with their respective groups for under a year and had only one individual session per week in addition to the group session. One such case, diagnosed as "essential" or "primary" depersonalisation, attends at the present moment at St. Bartholomew's Hospital a weekly group analytic session—together with seven other patients—and she progresses very well indeed, without any supplementary individual session.

These results are due in no small degree to the superior power of the group situation, if it can be harnessed to the service of therapy.

London, W.1. S. H. FOULKES.

STREPTOMYCIN IN INFLUENZAL MENINGITIS

SIR,—Dr. Cormac's letter in your issue of Nov. 8 necessitates a reply from me.

In a disease such as influenzal meningitis in infancy, which had a mortality of almost 100% before specific therapy was introduced, an obvious clinical response to massive doses of penicillin in 3 cases, despite the bacteriological reports that the organisms were insensitive to penicillin, was suggestive that this "insensitivity" was merely relative to the concentration of penicillin used in the test. This was, in fact, confirmed by Dr. E. N. Allott in our last 2 cases, when he found the bacteria to be markedly sensitive to higher concentrations of penicillin; but the strains varied widely in their sensitivity. The clinical study of 4 cases of influenzal meningitis was therefore sufficient to prove that this disease will respond to massive doses of penicillin and that the view originally held, that *H. influenzæ* was insensitive to penicillin, was incorrect. Later, when reviewing the literature, I came across the paper by Gordon and Zinnemann,[1] who had made a similar observation in their laboratory on examination of eighteen different strains of *H. influenzæ*. They found all these to be inhibited by high concentrations of penicillin, but in very varying degree. Our clinical experience and independent conclusion was thus entirely in keeping with their bacteriological findings.

I therefore maintain that the use of streptomycin in the treatment of influenzal meningitis does not appear to be justified at present, owing to its limited supply, until penicillin in massive dosage has at first been tried and found ineffective. It seems to me to be more reasonable to confine its use at present to the treatment of as many cases as possible of the hæmatogenous forms of tuberculosis and for a clinical trial against infections due to other sulphonamide-resistant and penicillin-resistant bacteria.

St. Alfege's Hospital, London, S.E.10. B. GOTTLIEB.

1. Gordon, M., Zinnemann, K. *Brit. med. J.* 1945, ii, 795.

HORMONE TREATMENT BY IMPLANTING PELLETS

SIR,—In reviewing at the moment my cases of Simmonds's disease for detailed reporting, I am reminded that the general statement I made in my letter published on Oct. 11 applied to the more usual use of testosterone in eunuchoid cases, and I should be obliged if you would permit me to add that testosterone tablet implantations in Simmonds's disease, in women, are less well tolerated than in eunuchoidism, and not infrequently are extruded from the site of implantation.

It would appear, therefore, that not only the physico-chemical properties of the implanted hormone but also the reactivity of the tissues are important; and that this reactivity is, at least to some extent, dependent upon the particular endocrinopathy.

London, W.1. S. L. SIMPSON.

RENAL CIRCULATION

SIR,—In their letter (Nov. 22) Dr. Trueta and Dr. Barclay state that at the meeting of the Physiological Society on June 15, 1946, they—

> "exhibited photographs and photomicrographs of kidneys that 'incline us to believe that the by-passing is effected, at least in part, via the vasa recta.' We demonstrated vasa recta with their loops *arising from glomeruli at the base of the cortex and at that time, called them basal glomeruli.*"

It is most unfortunate that this last sentence, especially that part which I have italicised, or its equivalent, was omitted first from their report in the proceedings of the Physiological Society (*J. Physiol.* 1946, **105**, 27) and secondly from their preliminary communication in THE LANCET (1946, ii, 237). Permit me to quote the pertinent paragraphs from these communications. In the first-mentioned they concluded:

> "Evidence . . . shows that short-circuiting of various degree can occur in the kidney and . . . that it can be accompanied by functional cortical ischæmia. This suggests a much greater degree of short-circuiting than could be accounted for by anatomical evidence so far published, and our investigations, though they are not yet complete, incline us to believe that the by-passing is effected, at least in part, via the vasa recta."

In the second they wrote:

> "The above observations show that as a result of appropriate nerve-stimulation the blood may be diverted wholly or partly from the cortex and short-circuited through medullary (especially subcortical) blood-channels. The large potential capacity of these by-passing channels enables them to transmit the whole of the renal blood inflow whenever the supply to the cortex is diverted and the latter thereby rendered ischæmic.
>
> "To locate the by-passing channels histologically, particulate material was injected in place of dyes, and was found to fill vasa recta and their loops, as well as a subcortical plexus of vessels (also of very much more than capillary calibre) suggesting that these two sets of vessels were the anatomical channels involved. These histological studies are being continued."

In brief, at first they considered the by-passing to be "effected, at least in part, via the vasa recta," and later they demonstrated "vasa recta and their loops, as well as a subcortical plexus of vessels . . . suggesting that these two sets of vessels were the anatomical channels involved."

There are two kinds of vasa recta in the kidney—vasa recta vera and vasa recta spuria. There is no indication which was thought to be concerned. Furthermore, in a matter affecting a short-circuit in the circulation in the kidney, a thing so fundamental as the glomerular or non-glomerular aspect of the short-circuit is omitted; indeed neither the word "glomerulus" nor "glomeruli" appear in either communication. However it was stated that the investigations were not yet

completed and that the histological studies were being continued.

Such then was the declared stage when my letter appeared (*Lancet*, 1946, ii, 436) in which, following argument and examples, anatomical, physiological, and pathological, and finally mathematical, I stated:

> "... from a consideration of the hæmodynamics of the renal circulation in the rabbit, it is possible to suggest that the degree and character of the altered renal circulation, as outlined by Dr. Trueta and his colleagues, and the 'redistribution of blood-flow within the kidney' discussed by Professor Maegraith (p. 213), could be maintained by a circulation via the deep (subcortical or juxtamedullary) glomeruli only, the cortex being relatively avascular, by vasoconstriction of the peripheral arterial vessels in response to afferent (sciatic or other) stimuli."

My experimental work was first reported to, and demonstrated at, a meeting of the Pathological Society of Great Britain and Ireland held in July, 1941. This was the year in which I described the *juxtamedullary glomeruli*, as I mentioned at the recent meeting of the Royal Society of Medicine.

North Middlesex County Hospital, London, N.18. J. F. HEGGIE.

SPIRILLUM MINUS TREATMENT OF G.P.I.

SIR,—The records of the experiment in therapy described here were lost during the Malayan campaign. Dr. W. R. Logan, who investigated the cases clinically and made elaborate records of the progress of the patients, lost his life at the Alexandra Hospital when it was stormed by Japanese troops a few days before the surrender of Singapore. His death was a serious loss to psychiatry in the Far East and to many friends who appreciated his ability and personal charm.

General paralysis of the insane (G.P.I.) is by no means rare in the Federated Malay States. In 1940–41, when this investigation was carried out, we identified more than 100 cases by clinical and serological criteria in a population of rather more than 3000 patients at the Central Mental Hospital. The patients included Chinese, Malays, and Indians, the first-named predominating. Syphilis is prevalent among the Chinese and Indians in the cities and towns, but relatively uncommon among the riverine Malays, who are however subject to yaws.

The treatment of G.P.I. in Malaya presented two special difficulties. First, patients seldom reached the Central Mental Hospital until they were in an advanced state of physical and mental deterioration. Most of them had received no antisyphilitic therapy since they were first infected. About half the cases in this experiment were beyond treatment and could only be regarded as forlorn hopes. Only a few patients, who had held clerical appointments in the government service or had been in some other position that brought them to hospital relatively early in the course of their complaint, could be considered in any way promising material. The second difficulty was that most of the patients had had malaria, wherefore the possibility of successful malaria therapy was remote. Further, in the presence of anopheline mosquitoes capable of transmitting malaria there was the risk that other patients might be accidentally infected. Since we had no apparatus for inducing hyperpyrexia, we had to try some other method.

Sporadic cases of rat-bite fever (sodoku) are not uncommon in Malaya. During the latter part of 1940 one of us (J.O.P.) saw 2 cases. In the first case, though cultural methods failed, the infection was easily established in guineapigs. Two experimental infections made with guineapig blood did not give rise to an adequate fever, and this strain, though maintained for a while, was not used again. In the second case the infection was again established in guineapigs. Since this strain appeared to be more virulent it was used for the remainder of the experimental infections of cases of G.P.I.

No difficulty was encountered in maintaining the strains by passage in guineapigs. The animals were inoculated by the intraperitoneal route and about a week later became feverish, their eyes bloodshot, and their appetites poor. For one or two months their condition would slowly deteriorate, with loss of weight and an increasingly mangy appearance. They were then killed, and blood or liver emulsion from them was introduced into other animals. In this way an ample supply of blood for the inoculation of patients was always available.

Spirillum minus was repeatedly identified in the blood and livers of the guineapigs, both in wet and in stained preparations. The morphology of the two strains appeared to be identical, the spirilla varying greatly in length, number of spirals, and number of flagella.

Forty experimental human infections had been completed when war ended the investigation. In the first 6 cases guineapig blood was introduced into the skin of the arm. In 2 of these cases the development of fever was accompanied by serious ulceration spreading from the point of inoculation. In one case the ulcer spread until its diameter was about 6 in. and it had involved the underlying muscle to such a degree that the humerus was almost exposed. The healing that followed treatment with neoarsphenamine was remarkable, the scarring being far less than one could have believed possible. This method of introducing the infection was abandoned, and in the remaining cases a few drops of guineapig blood or liver emulsion diluted ten times with saline were injected into the antecubital vein with a fine needle, every effort being made not to allow any of the infected fluid to contaminate the skin or subcutaneous tissue. In a few cases a small ulcer developed at the site of inoculation, but in the remainder there was little or no local reaction.

The incubation period was seven or eight days in nearly all cases. A few patients had premonitory symptoms on the fifth or sixth day, and in a few others the onset of symptoms was delayed by a few days. Only in two or three cases was there a failure to infect at the first attempt, and in none of these was a second inoculation unsuccessful. The fever produced was satisfactory in a high proportion of cases, reaching a peak of 104°F, usually on the third evening after the onset of symptoms. In 2 cases a maximal temperature of 106°F was achieved. The fever was accompanied by considerable prostration, and the condition of some of the patients at this time was rather alarming because of their collapsed state and rapid and almost imperceptible pulse; yet no patient died during the febrile phase, and the recovery in their condition as the fever passed was remarkable. The temperature never remained high for more than 72 hours.

Most of the patients showed the typical dusky maculopapular rash during the fever, and in a few instances a hot bath revived the rash a day or two after it had apparently cleared. In those cases in which a leucocyte-count was made during fever there was a well-marked neutrophil leucocytosis and often an increased proportion of eosinophils. The second bout of fever usually occurred about the sixth day after the first and was usually as severe as the first and in a few instances more severe. In most cases the third cycle showed a falling off, and it was our usual practice to terminate the infection the day before the fourth or fifth rise of temperature was expected. In some cases one injection of neoarsphenamine 0·5 g. was insufficient, and in a week or so the temperature rose again. Three injections of 0·5 g. at intervals of five days never failed to terminate the infection.

Albuminuria was usually present during the pyrexial period, often with casts, and it tended to persist, though diminishing, even after the fever had been terminated. Four patients died in uræmia, and the tendency to a progressive nephritis was a serious drawback to this method of fever therapy. In view of the fact that *Treponema pallidum*, *Sp. minus*, and arsenic all have a predilection for inflicting renal damage it is perhaps surprising that there were not more deaths from uræmia. It is most unfortunate that the organs removed post mortem from these cases and preserved were never studied.

In about 6 cases spectacular improvement in the mental condition was judged by Dr. Logan to have taken place. One previously intelligent Malay, who had held a position of some responsibility in the government service and, though in an early stage of dementia at the time of treatment, was in good physical condition, apparently recovered completely; but his subsequent history is unknown. Some other patients also showed evidence of improvement. For about half the patients, many too advanced to be a fair test of the treatment, the only result was a further decline in their physical condition.

Adelaide. J. ORDE POYNTON.

THE CHRONIC PARETIC

SIR,—I was interested in Dr. Kirman's article last week as I had made a similar investigation on a small series of 15 cases, the result of which was summarised in the *Annual Report of the Board of Control* (1933, part 2, p. 71). I then found that the minimum interval after malaria therapy for the establishment of negative reactions in the cerebrospinal fluid (C.S.F.) was eleven months. The Meinicke clarification reaction appeared to be the most sensitive and remained positive in the blood and C.S.F., but I have no doubt this too became negative after the lapse of more years. It is interesting to note that in Dr. Kirman's series nearly 50% showed negative blood Wassermann reactions. In my series they all became negative, but of course the number was too small for accurate statistical conclusions.

The important point to stress—I do not think this is too well known by general practitioners—is that the attainment of negative reactions by no means guarantees a cure.

I. ATKIN
Medical Superintendent.
Park Prewett Mental Hospital, Basingstoke.

TEACHING APPOINTMENTS

SIR,—Possibly I am attaching too much importance to the unsigned letter on the above subject which appeared last week; but the accusation that medical schools have appointed unsuitable persons to professorships of medicine is a serious one which appears to call for an answer, however irresponsible the accuser.

"M.R.C.P." tells us that he knows "from personal experience and the opinions of interested friends" that the teaching of medicine in many schools is of poor quality, and he apparently attributes this in large part to the appointment of "research-workers" to chairs of medicine. I cannot claim personal knowledge of all medical schools in the country; but I greatly doubt the validity of the writer's adjective, "many." And I can say, from personal acquaintance with numerous teachers in several schools and from knowledge of their students' opinion of them, that it is to those very teachers against whom "M.R.C.P." directs his criticism that I myself should turn to find examples of most of those qualities which he rightly implies to be desirable in those responsible for medical teaching—"knowledge of general medicine, clinical experience, ability to lecture, enthusiasm, and flare [sic] for teaching." "M.R.C.P." tells us that research-workers are often bad clinicians and poor teachers. That may be; but it is not from among this group, however valuable their contribution to society, that medical schools make their appointments to chairs of medicine.

J. G. MCCRIE
Dean, Faculty of Medicine.
The University, Sheffield.

SIR,—Your anonymous correspondent "M.R.C.P." has done well in directing public attention to the disastrous consequences of appointing teachers who cannot teach. Yet in the name of progress this policy has been adopted by our universities. In so doing, they have abandoned the first principles of education as known to western civilisation. To make this clear beyond a peradventure, I would quote a profound thinker and the greatest prose writer of the last century, Cardinal Newman [1]:

> ". . . when the Church founds a University, she is not cherishing talent, genius, or knowledge, for their own sake, but for the sake of her children, with a view to their spiritual welfare and their religious influence and usefulness, with the object of training them to fill their respective posts in life better, and of making them more intelligent, capable, active members of society.
>
> "Nor can it justly be said that in thus acting she sacrifices Science, and, under a pretext of fulfilling the duties of her mission, perverts a University to ends not its own, as soon as it is taken into account that there are other institutions far more suited to act as instruments of stimulating philosophical enquiry, and extending the boundaries of our knowledge, than a University. Such, for instance, are the literary and scientific 'Academies' which are so celebrated in Italy and France, and which have frequently been connected with Universities, as committees, or, as it were, congregations or delegacies subordinate to them. . . . The nature of the case and the history of philosophy combine to recommend to us this division of intellectual labour between Academies and Universities. To discover and to teach are distinct functions; they are also distinct gifts, and are not commonly found united in the same person."

1. The Idea of a University. 3rd ed. London. 1873. Pp. 12 and 13.

After Newman's stately prose I have nothing to add, save to answer in advance him who shall say: "You can't put the clock back." If your clock is wrong you put it right; and if you are approaching the brink of a precipice you go back—or perish.

HALLIDAY SUTHERLAND.
London, W.8.

FLARE-UP IN THE GLASS HOUSE?

SIR,—The feast of jugged hair (Nov. 22, p. 773) was suitably illumined by the weird glow of the flare in the next letter with its "flare for teaching." Spelling apart, we do not speak of "flair," but only of "*a* flair," and it means a keen nose for scenting the not very obvious; it does not mean a gift in general.

Prof. Pomfret Kilner himself is not quite blameless, for he writes "inapt": this is rightly condemned as a bastard blend of "inept" and "unapt."

AQUARIUS.

HANDKERCHIEFS IMPREGNATED WITH DISINFECTANT

SIR,—The possibilities of treating textiles with disinfectants are of considerable general interest.

We have recently had an opportunity to try out a relatively simple method of impregnation applicable to both cotton and woollen fabrics and capable of large-scale adaptation. In this method the fabric is first immersed in a solution of a soluble disinfectant—such as phenyl mercuric acetate—and this is followed by treatment with a solution capable of precipitating the disinfectant within the textile fibres in a relatively insoluble form: in the example quoted, sodium bromide would precipitate phenyl mercuric bromide.

A disinfectant suitable for this purpose would have to possess a very high phenol coefficient, as relatively little would diffuse out, and it would also require to be non-toxic. Preliminary tests with phenyl mercuric bromide have shown that a practical disinfecting action can be obtained on cotton handkerchiefs, but further investigation is necessary to exclude the possibility of toxic or irritant effects of this substance.

Although this method is still in the experimental stage, we thought its inherent possibilities and its potential importance in public health of sufficient interest to bring to your notice.

K. DUMBELL
J. E. LOVELOCK
E. J. LOWBURY.
National Institute for Medical Research Common Cold Research Unit, Harvard Hospital, Salisbury, Wilts.

Public Health

Tuberculosis in Lancashire

IN 1946 only 3·7% of all deaths in Lancashire were due to tuberculosis. Notifications of new pulmonary cases, which apart from a check in 1945 have risen steadily since 1939, reached 1663, the highest figure since 1927; men between 20 and 34 were chiefly affected, and Dr. F. S. Bradbury,[1] the central consultant tuberculosis officer, mentions the probable influence of war service in some of these cases. Deaths from pulmonary tuberculosis, though more numerous than in 1945, were lower than in the previous year. The chief rise in both sexes was in the age-group 35–44, whose responsibilities are most likely to interfere with treatment. In the age-group 15–24 there was a 13% reduction in pulmonary deaths; and this is attributed to earlier discovery of cases, in which mass radiography is held to have played a leading part. Notifications of non-pulmonary cases were only 104, the lowest figure on record, and 16% less than in 1945. Deaths from non-pulmonary tuberculosis also reached a new low record.

Sanatoriums were hampered by lack of staff, but have somehow managed to keep their beds full and their waiting-lists fairly short. In September, 1947, the

1. Report of the Tuberculosis Services of the Lancashire County Council, 1946. Preston: T. Snape. 1947. Pp. 42.

waiting-list was 138 for the county, representing 10% of the number of beds occupied; and this percentage is much lower than the figure for England and Wales as a whole.

Poliomyelitis and Polioencephalitis

During the week ended Nov. 15 the fall in notifications of poliomyelitis, 186 (198), was again small, and there was a slight rise in those of polioencephalitis, 15 (12). Figures for the previous week are shown in parentheses. Notifications of poliomyelitis in London were 12 (16); and there was a small reduction in most of the southern counties except Kent 15 (4) and East Sussex 9 (3). The northern counties also showed reductions for the most part, but there was a slight upward trend in East Anglia and the west.

Infectious Disease in England and Wales

WEEK ENDED NOV. 15

Notifications.—Smallpox, 0; scarlet fever, 1947; whooping-cough, 1217; diphtheria, 195; paratyphoid, 8; typhoid, 11; measles (excluding rubella), 2355; pneumonia (primary or influenzal), 582; cerebrospinal fever, 40; poliomyelitis, 186; polioencephalitis, 15; encephalitis lethargica, 2; dysentery, 95; puerperal pyrexia, 117; ophthalmia neonatorum, 58. No case of cholera, plague, or typhus was notified during the week

Deaths.—In 126 great towns there were no deaths from enteric fever, 2 (0) from measles, 3 (1) from scarlet fever, 3 (0) from whooping-cough, 2 (1) from diphtheria, 61 (4) from diarrhœa and enteritis under two years, and 13 (2) from influenza. The figures in parentheses are those for London itself.

The number of stillbirths notified during the week was 196 (corresponding to a rate of 25 per thousand total births), including 28 in London.

Medicine and the Law

Death or Injury "attributable to war service"

In a lengthening series of appeals under the Pensions Appeal Tribunals Act of 1943 Mr. Justice Denning has had to decide whether a death or injury was "attributable to war service." This is not exclusively a medical question; the element of causation introduces arguments on which an appeal tribunal may misdirect itself. Two recent cases, decided in the present month, illustrate the difficulty. In one a man who had served in a balloon crew claimed that his hernia was a war injury. The conditions of his duty exposed him to the catching of a cold; he developed a cough, and a fit of coughing produced the rupture. One cause, perhaps a predominant cause, was the weakness of the abdominal wall; but one of the operative causes was his war service, and he was allowed a pension. In the other recent case, Monaghan *v.* Minister of Pensions, a man, 42 years of age, was working in Holland in the Pioneer Corps on the erection of a Bailey bridge. Some Canadians, it was alleged, gave the pioneers some gin, saying that it came from an abandoned Red Cross barge; the man drank and died two days later in hospital, having been admitted suffering from gin poisoning. The judge held that the cause of death was the drinking of raw spirit, an act entirely within his own personal sphere; the war service was only part of the surrounding circumstances. The pensions appeal tribunal rejected the widow's claim, and the judge refused to interfere.

Monaghan's case indeed was not unlike the Wedderspoon case, decided some months earlier, where a surgeon lieutenant on board his ship took a dose of chloral hydrate because he suffered from insomnia. He died in his sleep; post-mortem examination showed that he suffered from a weak heart. Mr. Justice Denning held death not to be attributable to war service. If the doctor had carelessly given an overdose to a member of the ship's company, the man's death would have been attributable to war service. But this dose was taken by the deceased in prescribing for himself. It was "the case of a man, who happened to be a doctor, taking too large a sleeping draught in his personal capacity . . . no more attributable to war service than the consequences of drinking too much or playing a game of squash."

The element of casuistry is intriguing. The leading decision of the judge is the Chennell case of last year. A boy found an incendiary bomb, took it into a Chertsey street, and played with it. There was an explosion which injured a girl who was passing by. The Ministry rejected her claim that it was a war injury entitling her to compensation. The pensions appeal tribunal allowed the claim and the judge approved. The dropping of the bomb by the enemy was a cause; the boy's interference was not so powerful an intervening cause as to supersede it.

The problems of causation are probably hardest where the ætiology of a disease is uncertain. A year ago, in the Donovan case, the judge found himself able to allow the widow's claim where her husband had died from Hodgkin's disease. Recently, in James *v.* Minister of Pensions, there was evidence that the claimant had a swelling on the right side of his neck which gradually spread. He was sent to hospital, where Hodgkin's disease was diagnosed; he was then discharged from the Army on this account. He claimed a war pension, having apparently heard of the Donovan decision. His case, said the judge, was shortly and simply this: "As I have never known any illness prior to entering the Forces, and as medical science has not been able to find out how Hodgkin's disease is contracted, I think I have more right to say that it is due to war service than you have in saying it is not!" His claim was rejected by the Ministry; he died, and his widow claimed again in vain. The claim was out of time and the right to a rehearing required decision, so that the final result is still awaited. In giving leave to appeal, the judge observed that it would be hard if Donovan's claim succeeded and that of James was rejected.

Can medical science establish that cancer is a disease attributable to war service? In Miller *v.* Minister of Pensions, decided last July, the illness of an Army officer serving in the Middle East had been diagnosed as carcinoma of the œsophagus. He was flown back to England and died soon after his arrival. The claim was regarded as a test case and was referred to Sir Ernest Rock Carling as an independent medical expert. The pensions appeal tribunal concluded that the probabilities as a whole were that war service played no part in the disease, though it was recognised that there was a possibility the other way. The judge, reviewing the evidence and some previous decisions, observed that the ætiology of disseminated sclerosis was unknown, but experience indicated that external factors could influence its onset and development; claims in respect of this disease had therefore been allowed. On the other hand schizophrenia seemed likely to be, in the great majority of cases, essentially independent of external causes; claims in respect of schizophrenia had therefore been rejected. "If nothing else appears except that the cause [of death or injury] is unknown, then the only proper conclusion is that the Minister cannot discharge the burden of proof, because the unknown cause may be a cause incidental to war service."

Finally two neurosis cases may be mentioned. The facts in W. *v.* Minister of Pensions (1946) were that a man was discharged from the Army as permanently unfit by reason of severe and chronic anxiety due to his domestic marital affairs. Here the judge held that the war service played no active part; the neurosis was caused by the wife's conduct; his war service had not

aggravated the condition and therefore the claim failed. There was a similar result in the case of X.Y. *v.* Minister of Pensions last December. A soldier on embarkation leave had refused his fiancée's request that he should marry her before he went oversea. On return to his unit he received a letter from her in which she broke off the engagement. Four days later he shot himself in a military camp with a Service revolver. The pensions appeal tribunal held his death not to be attributable to war service. A military court of inquiry found that he met his death by his own hand while the balance of his mind was disturbed. The Ministry contended that the issue to him of a revolver and ammunition was an occasion for him to turn them against himself but not the cause of his so doing. The judge ruled that the cause was his trouble with his fiancée, a factor entirely extrinsic and unrelated to his Service life. These two cases perhaps were easier to decide, but even here the popular verdict might have gone the other way.

Parliament

FROM THE PRESS GALLERY

More about Our Calories

IN the House of Commons on Nov. 17, on the motion for the adjournment, Mr. E. P. SMITH pointed out that the British Medical Association's report on nutrition in 1933 demanded 3400 calories as the minimum daily diet to maintain working efficiency, and for people doing heavy work 3500–4000 calories were thought desirable.

In his brave but dispiriting speech on the Address, Sir Stafford Cripps had assessed our average daily intake of calories at 2870 which he admitted would have to be reduced. Mr. Smith thought that that reduction had probably taken place since the introduction of potato rationing. The Ministry of Food had stated that from rationed and pointed foodstuffs our daily average intake was 1530 calories, but very few of us, Mr. Smith believed, could in fact obtain the other 1340 calories from unrationed foodstuffs. The system of calculation used by the Ministry of Food had the essential demerit of over-simplicity. It consisted in dividing the amount of unrationed food consumed in the country—itself a notional figure—by the number of the population; and it included all meals consumed in restaurants and canteens, so that a poor old couple in a country village, who had no access to restaurants or canteens, were estimated to be receiving 2870 calories daily when, in fact, their intake was probably less than 2000 calories. A man in gaol, Mr. Smith concluded, received 2923–2955 calories daily, and a woman 2541–2605 calories; a boy in a borstal institution 2987–3051, and a girl 2521–2585 calories daily. In a dietetic sense, therefore, it paid nowadays to be an inhabitant of a gaol.

Dr. EDITH SUMMERSKILL, parliamentary secretary to the Ministry of Food, reminded Mr. Smith that the method of taking the amount of food consumed and dividing it by the population was devised not by her department but by the Scientific Committee set up during the Coalition Government by the Combined Food Board. Whatever its shortcomings it was a valuable means of comparing one period with another and the conditions prevailing in one period with those prevailing in another.

She also thought that Mr. Smith did not appreciate that the consumption levels quoted by her department were generally the average because they were asked for the average. There were of course wide variations in individual intake; when it was suggested the average calorie intake of the whole population was 2800, that included the intake of 900 calories by an infant and 4500 by a heavy worker. In quoting the number of calories consumed by a prisoner Mr. Smith was taking a specific number of calories consumed by one man doing a particular job. That could not be justly compared with an average for the whole country. Again, the average intake of an adult man might vary from 2500 calories to 4500 calories daily, and of an adult woman from 2000 to 3000 calories. The nursing mother, for instance, got 3000 calories a day. One hot meal a day, Dr. Summerskill added, equalled 900 calories, and one snack 500 calories, and when the average of a family was taken, it must be remembered that where the wage-earner was feeding outside the food he would otherwise consume was consumed by the family.

QUESTION TIME

Source of Our Calories

Mr. G. R. CHETWYND asked the Minister of Food whether he would give the calorie content of the no. 2 diet suggested for an adult man by the British Medical Association in 1933; and of the present average diet in the following proportions: proteins, fats, and carbohydrates.—Dr. E. SUMMERSKILL replied: Of the 3386 calories in the B.M.A. diet no. 2,12% were derived from protein, 28% from fat, and 60% from carbohydrate. The corresponding proportions in the present-day average diet are 12%, 33%, and 55% respectively.

Rehabilitation Centres in Scotland

Mr. E. G. WILLIS asked the Minister of Labour if he would consider the establishment of an Industrial Rehabilitation Centre in Scotland.—Mr. NESS EDWARDS replied: It is hoped to open early in 1948 two industrial rehabilitation units attached to Government training centres in Scotland; one at Hillington, Glasgow, and one at Granton, Edinburgh. Each unit will have accommodation on a non-residential basis for 100 persons.

Government Grants for Cancer Research

Mr. P. FREEMAN asked the Lord President of the Council what was the total grant made from Government funds for the purpose of cancer research in each of the last 20 years; and in what form it was proposed to continue these grants after the Public Health Act, 1947, came into operation.—Mr. H. MORRISON replied: Expenditure on cancer research from the parliamentary grant-in-aid for the work of the Medical Research Council has been at the rate of approximately £6000 per annum during the greater part of the period mentioned, this provision being of course supplementary to the much larger expenditure from the endowments and other resources of unofficial organisations concerned with this particular field. Expenditure from the same source in the financial year 1946–47 was about £12,000, and expenditure in the present financial year is estimated at £31,000 (including £14,000 of a non-recurrent nature). Substantial additional expenditure in the future has been approved for research on applications of atomic physics to the treatment of cancer. These activities are not affected by the National Health Service Act, 1946.

Mr. SOMERVILLE HASTINGS: Is the sum mentioned sufficient for the legitimate demands of those who are engaged in this research?—Mr. MORRISON: I think so, in the light of the useful activities which can be conducted. Considerable sums are being spent elsewhere in the field of research under the auspices of the Ministry of Health, hospitals, and what not. I do not think there is any difficulty about money, but I would be prepared to consider further developments if useful avenues of research were available to us.

Future of Private Homes

Mr. H. CHANNON asked the Minister of Health whether, in drawing up detailed plans for the National Health Service, he could give an assurance that everything would be done to assist and encourage the provision of private registered nursing and maternity homes to supplement the main hospital scheme.—Mr. A. BEVAN replied: Private homes are outside the scope of the National Health Service Act, and their future must therefore depend on the demand for private treatment outside the service.

Accommodation for Mental Defectives

Mr. W. R. SORENSEN asked the Minister what progress had been made during the past twelve months in providing accommodation for mental deficients; and approximately how many mental deficients were now awaiting suitable institutional accommodation.—Mr. BEVAN replied: Premises acquired by local authorities will provide 160 beds in the immediate future. Further accommodation will be available in the new year in three mental deficiency colonies released by Service departments. Mental defectives awaiting institutional accommodation were 3890 on Jan. 1 last.

Obituary

WILLIAM SEAMAN BAINBRIDGE

M.D., SC.D.

WE have received from Mr. Sampson Handley the following tribute to Dr. W. S. Bainbridge of New York, who died on Sept. 22. "In the years before the first world war," Mr. Handley writes, "Bainbridge was a frequent visitor to Europe, and wherever he went his kindly personality, his abounding energy, his open-mindedness, and his genius for friendship made him the welcome ambassador of American to European surgery. Dr. Bainbridge's book, *The Cancer Problem*, gave a catholic account of its subject, with full and fair recognition of English workers, such as Bashford, Murray, and Lazarus-Barlow, and of the clinical work of British and Continental surgeons and of its author. It was translated into French, Italian, Spanish, Polish, and Arabic. In both world wars he served in the American Navy, and as medical inspector and commander Reserve Force had much to do with the training of young American naval surgeons. His many honours, governmental and academic, included decorations from 18 nations. Bainbridge lived a full life, and his work survives him to mould the future."

ROBERT CARMICHAEL WOOD

M.B. EDIN., M.R.C.P.E.

Dr. R. C. Wood, who died on Nov. 23, graduated at the University of Edinburgh in 1932 and took his M.R.C.P.E. four years later. After qualifying he held resident appointments in Edinburgh at the Royal Maternity Hospital, the Hospital for Sick Children, and the Royal Infirmary. During the late war he served in the R.A.M.C., with the rank of major, as a medical specialist at a general hospital in the Middle East, and in 1945 (with K. C. Dixon) he published a paper on tick-borne relapsing fever in Cyprus.

G. A. G. P. and R. W. D. T. write: "Many war-time friends will regret the early death of Bertie Wood, in addition to the wide circle in Edinburgh and, of course, his patients. He had more than his share of service overseas and none longed more deeply to be home again. In those trying days he was a great colleague; not only a good physician, hard working, reliable, and loyal, but one of those whose companionship made all the difference to his friends. We shall miss him sadly down the years."

Births, Marriages, and Deaths

BIRTHS

COX.—On Nov. 14, the wife of Dr. P. J. N. Cox—a daughter.
EVANS.—On Nov. 11, at Worcester Park, the wife of Dr. E. A. Evans—a son.
GARROD.—On Nov. 19, in London, the wife of Dr. Oliver Garrod—a son.
KING.—On Nov. 19, at Wellington, New Zealand, the wife of Dr. A. S. King—a son.
LISTER.—On Nov. 17, the wife of Mr. Arthur Lister, F.R.C.S.—a son.
PALEY.—On Nov. 16, the wife of Dr. R. G. Paley—a daughter.
TODD.—On Nov. 14, at Bath, the wife of Dr. W. A. Todd—a daughter.

MARRIAGES

BROADBENT—LLOYD.—On Nov. 15, John Dennis Broadbent, M.R.C.S., to Judith Lloyd.
BUSH—FARNSWORTH.—On Nov. 1, at West Norwood, John Peter Bush, M.R.C.S., to Edith Mary Farnsworth.
NICHOLSON—MARSHALL.—On Nov. 15, David Percy Nicholson, M.B., to Mary Marshall.
WHOWELL—MURRAY.—On Nov. 15, in London, William Brian Whowell, M.B., to Joy Murray.

DEATHS

ATKINSON-FLEMING.—On Nov. 14, in London, Frederick Charles Atkinson-Fleming, M.C., B.A., M.B. Dubl., major, R.A.M.C. retd.
BENTALL.—On Nov. 16, William Charles Bentall, O.B.E., F.R.C.S.E., aged 72.
COSGROVE.—On Nov. 17, at Sydney, Australia, Charles Cosgrove, M.C., L.R.C.P.E.
EAVES.—On Nov. 21, Elizabeth Cowper Eaves, M.D. Lond., D.P.M.
FARQUHARSON.—On Nov. 16, in London, George Sinclair Farquharson, M.B. Lond., aged 84.
KNIGHT.—On Nov. 18, at Painswick, Charles Voughton Knight, M.D. Lond., aged 75.
MOFFAT.—Robert Unwin Moffat, C.M.G., M.D. Edin.
MONTGOMERY.—On Nov. 19, at Wolstanton, Staffs, Anna Pauline Montgomery, M.D. Lond.

Notes and News

COMMITTEE ON CERTIFICATES ISSUED BY PRACTITIONERS

A COMMITTEE has been appointed jointly by the Minister of Health and the Secretary of State for Scotland to investigate "how far it would be practicable to reduce the number of certificates to be signed by medical practitioners." The committee comprises: Mr. Archibald Safford, recorder of Faversham (chairman); Dr. J. C. Arthur, Gateshead; Miss Florence Hancock, chairman of the general council of the Trades Union Congress; Dr. Walter Jope, Glasgow; Mr. A. W. Neville, former principal assistant secretary in the Ministry of Health; and Mr. R. L. Briggs, Ministry of Health (secretary). The medical members were nominated by the British Medical Association.

FOOD AND HEALTH

IN the latest edition of his textbook[1] Prof. Henry C. Sherman, of New York, makes some points that are especially germane to the present situation. Having spent a life-time thinking and writing on his subject, he looks at the wood as well as the trees, and the landscape as well as the wood. He is attracted to Smuts's "holism," pointing out that evolution has proceeded among organisms availing themselves of the whole of other living organisms, and suggests that we are flying in the face of nature if we make use of highly refined commercial food products. Instead of asking for, and providing, more protein, calories, vitamins, and mineral elements, we should demand more milk, eggs, fish, fruit, and green vegetables—whole foods rather than their chemical constituents.

What is the advantage of adopting sound nutrition? Professor Sherman gives many answers, one of them quantitative. At Harvard, he says, King found that the chance of an infant being essentially a perfect specimen and showing robust health was four times greater when the mother's diet had been superior (graded "good" or "excellent"); and that the risk that the infant would have a low health rating was twenty times greater when the mother's diet had been inferior (graded "poor" or "very poor"). If these Harvard findings applied throughout the country, better nutrition in American homes would mean that well over a million babies each year would start their lives at a higher health level.

To those pessimists who fear the tendency among civilised peoples towards communities with an excess of middle-aged and elderly people, he points out that individuals most often attain their opportunities for highest service at about 45–50 years of age—i.e., when there remains but a third of the traditional span. The shortness of individual lives sets a limit to the actual use by man of the knowledge he has accumulated and the institutions he has built and developed. Sound life-long nutrition adds to the period of the flowering and fruiting of human intelligence, and therefore to the permanent well-being of the human race—a stimulating thought for those "past meridian."

HOMES OF ST. GILES

THE dread of the leper is largely misplaced. As we have lately noted,[2] only a small proportion of lepers are even potentially infective, and of the two or three hundred in this country the few who are infective can be taught to manage their disease so that it is not dangerous to others. For those who are unable to live at home one small colony exists—the Homes of St. Giles. This little-known charity was founded in 1914, and in an account of it[3] Dr. J. M. H. MacLeod, the chairman, tells how it was first housed in temporary buildings on a small farm in Essex. Now the temporary buildings have given place to comfortable brick bungalows, each with its own bed-sitting-room, kitchenette, and bathroom. A larger communal bungalow houses dining-room and kitchen, and a medical bungalow is equipped with an operating-room. The recreation hall is furnished with a billiards-table and a stage, and the patients have wireless sets in their bungalows. Occasionally the wives of non-infective patients are able to come to live with their husbands in the bungalows, and share in the nursing and domestic work of the colony. There

1. Food and Health. New York and London: Macmillan. 1947. Pp. 290. 20s.
2. *Lancet*, 1947, i, 487.
3. The Homes of St. Giles for British Lepers. 1947. Obtainable from the secretary, 170, Bishopsgate, London, E.C.2.

is also a guest-house, and a chapel has been made in the old farmstead barn.

The medical work is done by two visiting medical officers who live near by, advised by consultants from London. The nursing, originally undertaken by an Anglican sisterhood, is now the charge of sisters from the community of the Sacred Passion who have the care of lepers in East Africa. At present the homes take 10 men and 3 women, and also treat a few non-infective cases as outpatients, and nearly 60 patients have been treated since the homes opened.

The homes are a limited-liability company trading without profit, and are managed by an executive committee appointed by a council. Unaided by any Government grant, they depend for support on subscriptions and donations. Hard times are affecting the means, though probably not the will, of givers, and new subscribers are urgently needed. Those who wish to help should send their contributions to Mr. Arthur Stanley, the secretary, at 170, Bishopsgate, London, E.C.2.

KEEPING THE ENGINE WARM

A MECHANICALLY minded peripatetic correspondent, writing in 1942,[1] urged some enterprising manufacturer of electrical equipment to produce a gadget for starting a car off the mains—via a 12-volt transformer—and at the same time keeping the engine really hot when not in use by means of immersion heaters in the radiator. His hopes have partly been fulfilled, for immersion heaters for the radiator are now on the market. A simple form is that made by Messrs. Runbaken Electrical Products, of Manchester, in which the heater screws into the hole for the drain tap at the bottom of the radiator. When the car is in the garage the heater is connected to the mains, via a 12-volt transformer which also keeps the battery charged. If the car is left standing in a car-park or elsewhere the heater can be worked by the battery. The current consumption is 100 watts from the mains or 50/60 watts from the battery. Apart from ensuring easy starting such an immersion heater should save the petrol now used in warming up the engine.

Two simpler types of heater are worth considering, though these will not charge the battery. One—"Peter the Heater"—hangs inside the bonnet like a Davy lamp. Made by L. G. Hawkins, of Drury Lane, it consists of an element enclosed in a perforated cage, and runs from a light plug. The other is the Belling Air-warmer, a non-luminous type of heater made in cast-iron, which can be fixed horizontally to the garage wall. A number of projecting fins provide a large heating surface, and this device is both compact and safe. To the doctor who has often to start his car in the middle of the night even in winter, a heater is a valuable ally.

University of Cambridge

On Nov. 15 the degree of M.D. was conferred on E. B. Jarrett and N. D. Compston.

University of Sheffield

Prof. H. N. Green, who occupies the chair of pathology, has been granted the additional title of director of cancer research.

Having retired from the position of medical officer of health for Sheffield, Dr. John Rennie has resigned from the university chair of public health.

Royal College of Surgeons of England

A course of 72 lectures on anatomy, applied physiology, and pathology will be given at the college from April 5 to May 25 daily at 3.45 and 5 P.M. Practical demonstrations in these subjects will also be held daily from March 22 to June 11 from 10 A.M. to 1 P.M., and from 2 to 3.30 P.M. The demonstrations will only be open to those attending the lectures and will be limited to 40 students; preference will be given to those unable to obtain practical instruction elsewhere, and to ex-Servicemen. Applications should be sent to the secretary of the postgraduate education committee of the Royal College of Surgeons, Lincoln's Inn Fields, London, W.C.2, before Feb. 2 for the demonstrations, and before April 3 for the lectures.

Owing to the rise in costs, from Jan. 1 the charge for the monthly college dinners will be increased from £1 1s. to £1 5s.

Royal Institute of Philosophy

The King has accorded the title of Royal to the British Institute of Philosophy.

1. *Lancet*, 1942, i, 304.

British Association of Allergists

At a meeting held at Oxford on Nov. 15, it was decided to form this association, and the first general meeting will take place at St. Mary's Hospital, London, on Jan. 24. The speakers will include Dr. John Freeman and Mr. Frank Coke. Dr. A. W. Frankland, Wright-Fleming Institute of Microbiology, St. Mary's Hospital, Paddington, W.2, is the secretary of the new association.

Production of Penicillin

The penicillin factory at Speke which has been operated by the Distillers Company, as agents for the Minister of Supply, since December, 1945, will become a commercial undertaking on Dec. 1. A new company, the Distillers Company (Biochemicals) Ltd., has been formed especially for the purpose, and arrangements have been made for the entire output of penicillin (sodium and calcium salts), to be distributed by the following pharmaceutical houses: Allen & Hanburys, Boots Pure Drug Co., The British Drug Houses, Burroughs Wellcome & Co., Evans Medical Supplies, Imperial Chemical (Pharmaceuticals), Pharmaceutical Specialities (May & Baker).

Specialist Appointments in the L.C.C. Service

The London County Council last week approved a scheme for the enlargement of specialist staffs in the council's hospitals. In general, one position of medical superintendent, deputy medical superintendent, or senior resident medical officer has been abolished for each new specialist position. The following promotions have been made:

Senior physicians (*superintendents*), on a salary scale of £1500–£100–£1800 and house valued at £150 or allowance in lieu:

J. C. Evans, M.R.C.P., W. Feldman, M.R.C.P., W. G. Sears, M.R.C.P., B. A. Young, M.R.C.P. (all commencing at £1800).

Senior physicians (*deputies to superintendents*), on a salary scale of £1500–£100–£1800 with no emoluments and £50 a year as deputy:

Major H. C. Aston, M.R.C.P., R. D. Green, M.R.C.P., T. St. M. Norris, M.R.C.P., D. W. G. Smith, M.R.C.P., M. I. Toohey, M.R.C.P., C. E. W. Wheaton, M.R.C.P.

Senior physicians, on a salary scale of £1500–£100–£1800 with no emoluments:

J. A. Cardno, M.D., B. Freedman, M.R.C.P., B. Gottlieb, M.R.C.P., P. Harvey, M.R.C.P., Major A. Kahan, M.D., Wing-Commander J. H. G. Mason, M.R.C.P., Lieut.-Colonel H. E. S. Pearson, M.R.C.P.

Surgeon specialists (*superintendents*), on a salary scale of £1500–£100–£1800 and house valued at £150 a year or allowance in lieu:

W. P. Greenwood, F.R.C.S., R. A. V. Lewys-Lloyd, F.R.C.S., J. M. Milloy, F.R.C.S., J. R. M. Whigham, F.R.C.S. (commencing at £1800); J. E. Piercy, F.R.C.S.E. (commencing at £1500).

Surgeon specialists (*deputies to superintendents*), on a salary scale of £1500–£100–£1800 with no emoluments and £50 a year as deputy:

H. L. Cochrane, F.R.C.S., G. S. Ferraby, F.R.C.S., J. Gabe, F.R.C.S., J. C. Gillies, F.R.C.S.E., S. W. Holmes, F.R.C.S., I. W. Matheson, F.R.C.S., I. I. Price, F.R.C.S., K. F. D. Waters, F.R.C.S.E.

Surgeon specialists, on a salary scale of £1500–£100–£1800 with no emoluments:

T. J. Eason, F.R.C.S., Major A. N. McCrea, F.R.C.S., H. K. Vernon, F.R.C.S.

Physician superintendents, on a salary scale of £1500–£100–£1800 and house valued at £150:

J. S. Anderson, M.D., J. V. Armstrong, M.D., H. S. Banks, F.R.C.P., N. D. Begg, M.D., F. J. Bentley, F.R.C.P., W. C. Fowler, M.D., J. Watt, M.D. (commencing at £1800); J. C. Blake, M.B., William Gunn, F.R.C.P., W. H. Kelleher, M.D., M. H. Logg, M.D., G. W. Ronaldson, M.D., W. E. Snell, F.R.C.P. (commencing at £1700).

Assistant senior physicians (*deputies to physician superintendents*), on a salary scale of £1000–£50–£1400 with no emoluments and £50 a year as deputy:

Robert Swyer, M.R.C.S. (commencing at £1300); G. E. Breen, M.D., L. J. M. Laurent, M.R.C.P., J. C. McEntee, M.R.C.P. (commencing at £1250); J. W. Healey, M.D. (commencing at £1200); A. M. Ramsay, M.D. (commencing at £1150); W. J. P. Lillis, L.R.C.P.I., J. J. McCann, M.R.C.P., D. Porter, B.M., W. F. Richards, M.R.C.P. (commencing at £1050).

Assistant surgeon specialist (*deputy to medical superintendent*), on a salary scale of £1000–£50–£1400 with no emoluments and £50 a year as deputy:

R. Glyn Thomas, F.R.C.S. (commencing at £1150).

As announced last week, Brigadier R. H. Metcalfe, F.R.C.S., and Lieut.-Colonel R. C. F. Catterall, F.R.C.S., have been appointed to the service as surgeon specialists; their salary scale is £1500–£100–£1800 with no emoluments.

London Association for Hospital Services

Dr. W. Russell Brain has been elected chairman of this association in succession to Sir Bernard Docker, who will continue to serve as a member of the council.

Indian Obstetrical Congress

The fifth All India Obstetric and Gynæcological Congress will be held in Bombay from Dec. 25 to 29 under the presidentship of Sir A. Laxman Swami Mudaliar.

Medical Drawings

For the past year a group of students in the commercial art department of the St. Martin's School of Art (L.C.C.) have been trained in pathological drawing. They have also obtained practical experience by making drawings in operating-theatres of London hospitals. Surgeons or hospitals who may wish to employ them are invited to get in touch with the principal of the school, 109, Charing Cross Road, W.C.2.

Services Award

The North Persian Forces memorial silver medal for 1946 has been awarded to Dr. J. N. McArthur for his article, Malaria Transmission in Borneo, which was published in THE LANCET (1946, ii, 117). The medal is awarded for the best paper on tropical medicine or tropical hygiene published by a medical officer of under twelve years' service in the Royal Navy, Royal Army Medical Corps, Royal Air Force, Indian Medical Service, or Colonial Medical Service.

Speech Therapy Conference

The College of Speech Therapists is holding a conference in London from Sept. 20 to 24, 1948, when there will be sessions on the following subjects: Aim and Scope of Speech Therapy, Speech Disorders arising from Head Injuries, the Speech Clinic and the Speech Defective Child, and the Rôle of Emotional Problems in Producing Disorders of Speech. It is hoped that during the conference an International Federation of Speech Therapists will be set up again. The conference secretary's address is 68, Queen's Gardens, W.2.

Appointments

BONNIN, J. G., M.B. Melb., F.R.C.S., M.R.C.O.G.: first assistant, orthopædic and accident service, Oldham Royal Infirmary.
CAPLIN, MAXWELL, M.R.C.S.: tuberculosis officer, London Chest Hospital.
CUNLIFFE, A. C., M.A., M.D. Camb.: asst. bacteriologist and lecturer in bacteriology, King's College Hospital, London.
DEAN, J. H., B.A., M.B. Camb.: university asst. pathologist, Addenbrooke's Hospital, Cambridge.
DEAN, JOHN, M.B. Camb.: Wander scholar and registrar, Westminster Children's Hospital.
FINLAYSON, A. A., M.B. St. And., F.R.C.S.E.: otorhinolaryngologist, Hospital of St. Cross, Rugby.
JOULES, F. E., M.D. Lond., M.R.C.P.: chief assistant in medicine, Harefield County Hospital, Middlesex.
SUTHERLAND, CATHERINE, M.B. Edin.: asst. M.O., maternity and child-welfare department, Birmingham.
WALSH, BRIDGET, M.B. N.U.I., D.P.H.: medical director, mass-radiography unit, Leeds.
WOOLGROVE, C. G., M.B. Birm., D.P.H.: senior asst. school M.O., Coventry.

Queen Elizabeth Hospital for Children, London:

EVANS, C. F., F.R.C.S., D.L.O.: ear, nose, and throat surgeon.
HARRIS, E. O., M.B. Lond., F.R.C.S.: ear, nose, and throat surgeon.
SWAIN, V. A. J., F.R.C.S.: surgeon.

Bristol Eye Hospital:

BARTLETT, C. H., B.A., M.B. Camb., F.R.C.S.: surgical registrar.
WEAR, A. R., M.B. Leeds, D.O.: ophthalmic registrar.

West Bromwich and District General Hospital:

CANT, W. H. P., M.D. Lond., M.R.C.P.: pædiatrician.
WILLIAMS, G. E. O., M.D. Lpool, M.R.C.P.: physician.

London County Council Mental Health Service:

DUNKLEY, E. W., M.B. Lond., D.A., D.C.H., D.P.M.: second asst. M.O., St. Pancras Hospital mental observation unit.
FRYER, G. J. F., M.B.: asst. M.O., St. Bernard's Hospital, Southall.
LANTIN, HAROLD, M.B. Belf.: asst. M.O., Long Grove Hospital, Epsom.
MAY, P. R. A., M.B. Camb., D.P.M.: second asst. M.O., Cane Hill Hospital.
NICHOLSON, BERNARD, M.R.C.S.: asst. M.O., Banstead Hospital, Sutton.
SAINSBURY, PETER, B.A., M.B. Camb., D.P.M.: asst. M.O., Bexley Hospital.
VINCENZI, J. E. G., M.R.C.S.: asst. M.O., Claybury Hospital.

Colonial Service:

ALMOND, ISABELLA, M.B. Sheff.: M.O., Malaya.
EMMERSON, E. N., M.R.C.S., D.T.M. & H.: M.O., Tanganyika.
FERNANDES, H. P., M.R.C.S., D.T.M. & H.: health officer, tuberculosis, British Guiana.
RAM, L. M., M.B. Punjab, M.R.C.P., D.P.H.: M.O., Malaya.
SAMPEY, A. W., M.R.C.S.: M.O., Kenya.
WASE-BAILEY, B. N. V., M.D. Edin., D.T.M. & H., D.P.H.: senior M.O. (health), Sierra Leone.

City of Plymouth Mental Hospital

This hospital, previously known as Blackadon, has been renamed Moorhaven Hospital. The early treatment unit will continue to be known as Moorfields Hospital. The postal address of both is Ivybridge, South Devon.

Faculty of Homœopathy

On Thursday, Dec. 4, at 5 P.M., at the London Homœopathic Hospital, Great Ormond Street, W.C.1, Mr. Harold Dodd will speak on Five Ailments Aggravated by Present Austerity Conditions.

Dr. Arthur Metcalfe, Australian director-general of health and quarantine, is reported by B.U.P. to be leaving Australia on Dec. 14 for a three-months tour of Britain, Canada, and the United States. He will investigate methods of quarantine in relation to air travel.

CORRIGENDA: *Estimation of renal activity.*—The last sentence of the third paragraph in Mr. Cole's letter last week (p. 774) should have read: "Where U is the urinary concentration, P the plasma concentration, and V the minute-volume of urine, the clearance, represented by UV/P, can remain the same although U rises."

Malaria transmission by blood-transfusion.—The name of the correspondent who wrote a letter to the Editor on this subject last week (p. 772) was Dr. K. S. Rodan.

Diary of the Week

NOV. 30 TO DEC. 6

Monday, 1st

ROYAL COLLEGE OF SURGEONS, Lincoln's Inn Fields, W.C.2
3.45 P.M. Dr. A. Peacock: Middle Ear and Eustachian Tube.
5 P.M. Dr. J. Dougins Robertson: Disordered Metabolisms in Thyrotoxicosis and Myxœdema.
WESTMINSTER HOSPITAL, Horseferry Road, S.W.1
5 P.M. (Meyerstein lecture theatre.) Clinicopathological demonstration of osteogenic sarcoma.

Tuesday, 2nd

ROYAL COLLEGE OF SURGEONS
3.45 P.M. Prof. H. A. Harris: Anatomy of the Bladder and Prostate.
5 P.M. Prof. G. Payling Wright: Pathology of Primary Tuberculous Infection. (First lecture.)
INSTITUTE OF DERMATOLOGY, 5, Lisle Street, W.C.2
5 P.M. Dr. R. M. B. MacKenna: Erythema Group of Eruptions.

Wednesday, 3rd

ROYAL COLLEGE OF SURGEONS
3.45 P.M. Mr. H. F. Lunn: Flexor and Extensor Retinacula of Wrist and Ankle.
5 P.M. Prof. Payling Wright: Pathology of Primary and Tuberculous Infection. (Last lecture.)
ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1
2.30 P.M. *History of Medicine.* Dr. E. Ashworth Underwood: Charles Creighton (1847–1927)—Scholar, Historian, and Epidemiologist. Prof. M. Greenwood, F.R.S.: Epidemiology of Creighton.
8 P.M. *Surgery.* Sir Gordon Gordon-Taylor, Mr. R. McWhirter, Sir Stanford Cade: Carcinoma of the Breast.
SOCIETY OF CHEMICAL INDUSTRY
7 P.M. *Food Group with Society of Public Analysts and other Analytical Chemists.* (Burlington House, Piccadilly, W.1.) Mr. G. E. Forstner, A.R.I.C., Mr. G. W. Monier-Williams, PH.D., Mr. W. F. J. Cuthbertson, A.R.I.C., Mr. N. L. Allport, F.R.I.C., Mr. D. E. Garratt, PH.D.: Occurrence, Physiological Importance, and Estimation of Metallic Contaminants in Foodstuffs.
ROYAL FACULTY OF PHYSICIANS & SURGEONS, 242, St. Vincent Street, Glasgow
5 P.M. Dr. William Evans: Heart Murmurs. (Finlayson lecture.)

Thursday, 4th

ROYAL COLLEGE OF SURGEONS
3.45 P.M. Dr. D. V. Davies: Osteology of the Base of the Skull.
5 P.M. Dr. W. Feldberg: Vasodilatory Nerve Mechanisms.
ROYAL SOCIETY OF MEDICINE
8 P.M. Mr. W. Grey Walter, D.SC.: Electro-encephalogram in Organic Cerebral Disease.
INSTITUTE OF DERMATOLOGY
5 P.M. Dr. R. T. Brain: Filtrable Viruses.

Friday, 5th

ROYAL COLLEGE OF SURGEONS
3.45 P.M. Prof. J. D. Boyd: Development of the Liver and Pancreas.
5 P.M. Prof. R. Hare: Source and Transmission of Nasopharyngeal Infection.
ROYAL SOCIETY OF MEDICINE
10.30 A.M. *Otology.* Mr. I. Simson Hall, Dr. A. Young: Penicillin Treatment in Acute Suppurative Otitis Media.
2.30 P.M. *Laryngology.* Mr. G. H. Bateman: film on Organic Disorders of the Larynx. Mr. V. E. Negus: Bell Telephone film of the Laryngeal Movements.
5.30 P.M. *Anæsthetics.* Dr. J. K. Hasler: Posture in Anæsthesia.
LONDON CHEST HOSPITAL, Victoria Park, E.2
5 P.M. Dr. S. Roodhouse Gloyne: Pneumoconiosis.

Endocrine Deficiencies

During recent years the problem of treating conditions of hormonal dysfunction has become less obscure.

The isolation and synthesis of many of the steroid sex hormones has enabled British Schering to supply them as pure crystalline substances, accurate in standardization, reliable in action, and in a form convenient for administration.

'PROGYNON' · 'PROLUTON' · 'TESTOVIRON'

Professional literature available on request

BRITISH SCHERING LIMITED
167-169 Great Portland Street, London, W.1

200/H

Vitamin Therapy—its uses and limitations

GROWTH REQUIREMENTS IN CHILDHOOD

The relatively high metabolic needs of growing children must be met not only by energy-producing foods, but also by the factors needed for their metabolism, namely vitamin B1 (aneurine) and the co-enzymes of the vitamin B2 complex. Failure to supply these may be revealed in poor growth, debility, abnormal fatigue. Such a combination is highly suggestive of a deficiency of the factors—vitamins, protein, minerals—so richly supplied by Bemax.

BEMAX TABLETS
Six tablets provide the same amount of vitamin B_1 as the daily dose of Bemax. The tablets contain 50% Bemax, are tasty and should be chewed.

BEMAX
Stabilised cereal embryo

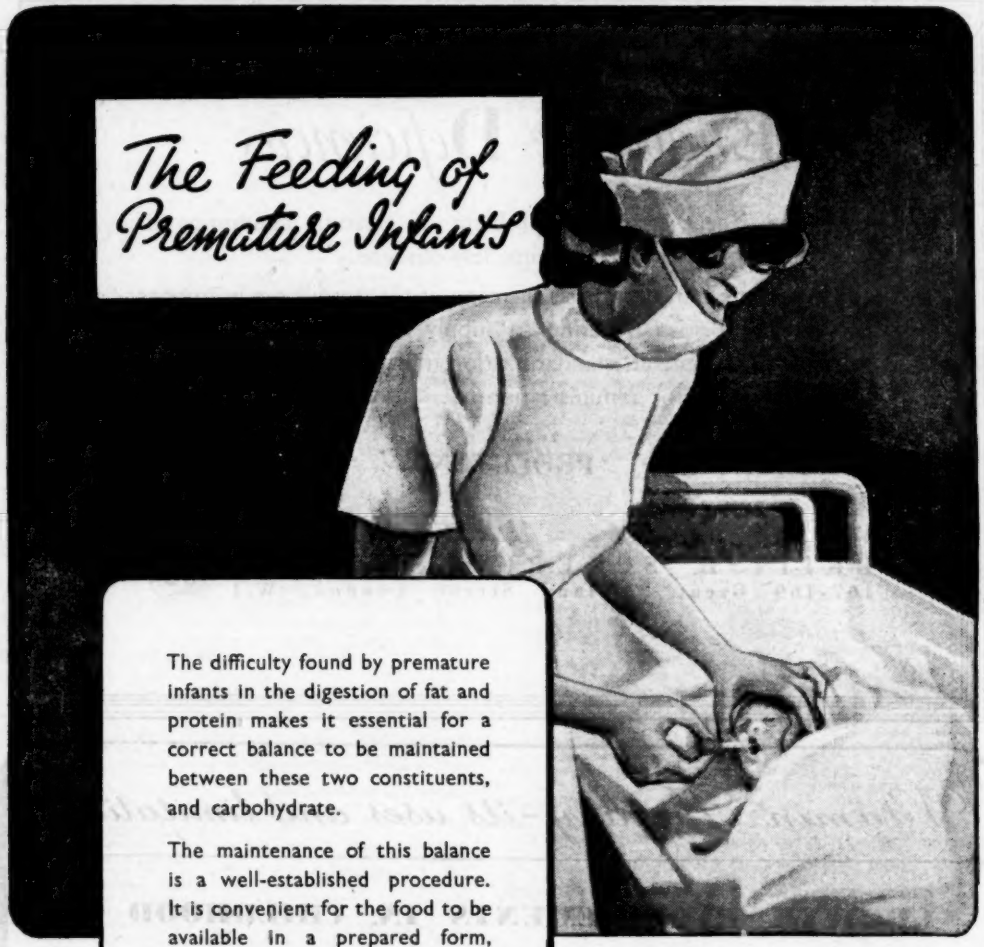
1 oz. of Bemax provides approximately :—

Vitamin B_1	0.45 mg.	Vitamin E	8.0 mg.	Protein	30%
Vitamin B_2 (Riboflavine)	0.3 mg.	Manganese	4.0 mg.	Available Carbohydrate	39%
Nicotinic Acid	1.7 mg.	Iron	2.7 mg.	Fibre	2%
Vitamin B_6	0.45 mg.	Copper	0.45 mg.	Calorific Value	104

References : Shortage of space precludes list of references but full documentation may be obtained on application to Clinical Research Dept. 27B.

Vitamins Limited
Upper Mall, London, W.6

The Feeding of Premature Infants



The difficulty found by premature infants in the digestion of fat and protein makes it essential for a correct balance to be maintained between these two constituents, and carbohydrate.

The maintenance of this balance is a well-established procedure. It is convenient for the food to be available in a prepared form, avoiding the necessity for adjustments in the home. The formula of **FRAILAC** is designed to present Fat, Protein and Carbohydrate in the following ratio :

1 : 1 : 6

In addition, the food contains 320 I.U's of Vitamin D per ounce.

COW & GATE MILK FOODS

Full details of the analysis, and samples for clinical trial are available on request from the Medical and Research Department

4002 **Cow & Gate Ltd., Guildford, Surrey**

'MIL-PAR' REGD.

ANTACID LUBRICANT

A pleasant and effective combination of 'MILK OF MAGNESIA' with a specially selected grade of MEDICINAL PARAFFIN. Particularly indicated in the treatment of chronic constipation and hyperacidity of the stomach due to disorder of the alimentary tract.

'MIL-PAR' neutralizes excess gastric acidity and checks the development of acid conditions in the food waste. Mixing freely with the fæcal mass it renders it soft and pliable and lubricates the intestinal tract without formation of oily pools and subsequent rectal leakage.

May freely be employed during convalescence from operation or protracted illness, for infants and children, expectant and nursing mothers.

SUPPLIES ARE LIMITED BUT SUFFICIENT STOCKS ARE AVAILABLE FOR DISCRIMINATE PRESCRIPTION

The Chas. H. Phillips Chemical Co. Ltd.
1, WARPLE WAY, LONDON, W.3

'Milk of Magnesia' is the trade mark of Phillips' preparation of magnesia

Against THE COMMON COLD

ESOBACTULIN Capsules present a notable advance in oral immunisation against common colds.

Specific antigens are normally destroyed by the gastric juices when taken by mouth. ESOBACTULIN capsules are specially processed to enable them to pass unchanged through the stomach and to dissolve in the alkaline medium of the lower intestine, where they are absorbed.

- **The complete course, designed to give 3 months' protection, consists of 6 capsules taken over five days.**
- **The capsules contain the anti-virin of, and the antigenic proteins from, 150 million of the following organisms: Staphylococci, *H. influenzæ*, Streptococci, Pneumococci, *M. catarrhalis*, *B. septus*, *M. paratetragenus*; also Immune Globulins 0.6 mgm., Vitamin A 3,000 I.U., Vitamin D 300 I.U., Vitamin B_1 1 mgm., Nicotinamide 5 mgm.**

Literature on request

SOUTHON LABORATORIES LTD.
Upper Richmond Road, London, S.W.15

ESOBACTULIN
protection against colds

Ribena therapy in infant welfare

The administration of vitamin C to infants has become a routine feature in child welfare. During the war, scarcity of orange juice was counterbalanced with excellent results by the use of other sources of the vitamin natural to Britain, notably blackcurrant juice, which the Ministry of Food approved as a particularly satisfactory alternative.

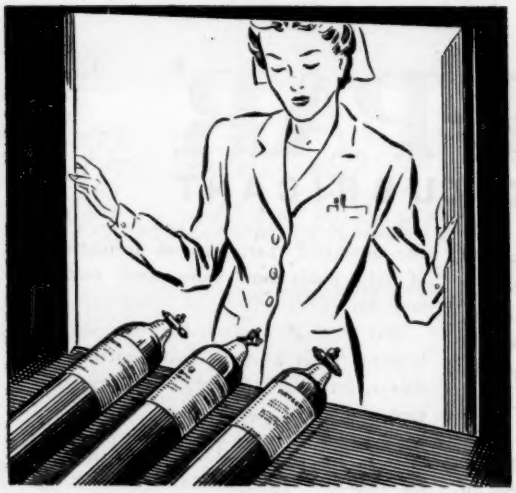
It is noteworthy that Ribena can be employed with advantage as a means of supplying natural vitamin C to infants from as early as the fourth week onwards; being quite free from cellular material, it cannot upset the most delicate digestion.

During the growing period generally, the vitamin C requirement is known to be much higher comparatively than during adult life, so that an accessory supply, as provided by 'Ribena,' is obviously of great benefit to children.

Ribena is standardised at not less than 20 mg. ascorbic acid per fl. oz.

Ribena
BLACKCURRANT SYRUP

H. W. CARTER & CO. LTD., THE OLD REFINERY, BRISTOL, 2



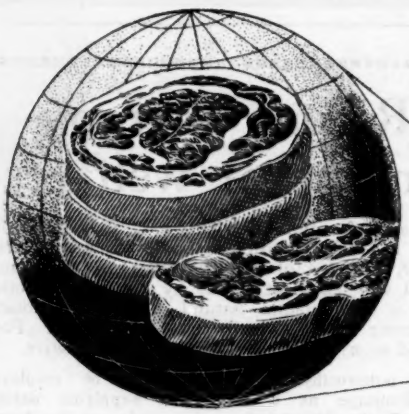
Army of unemployed

Hundreds of oxygen and other medical cylinders are lying idle in surgeries throughout the country. They should be in action in the battle against disease. Medical Gases are always readily available. Oxygen can be obtained day or night from BOC depots. It is stocked by leading chemists and by most hospitals. Sufficient cylinders in circulation will always mean more than sufficient medical gases. Practitioners are therefore asked to co-operate in keeping their waiting stocks to a minimum.

THE BRITISH OXYGEN COMPANY LIMITED

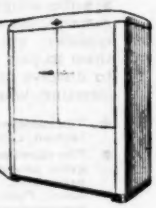
WEMBLEY, MIDDLESEX · RUSHOLME, MANCHESTER

INCORPORATING COXETER & SON LTD. and A. CHARLES KING LTD



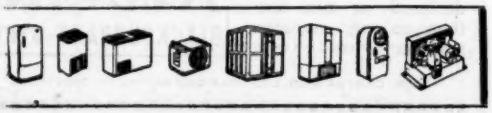
WORLD FOCUS ON

FOOD



In the fight for food, electric refrigeration plays a major part. For without electric refrigeration the present rations could not be maintained. In peace or war — wherever there is need for dependable automatic refrigeration — you'll find Frigidaire on the job.

For details of the latest developments in hospital refrigeration plant, consult your local Frigidaire Dealer. He will be pleased to advise you.



Frigidaire

DIVISION OF GENERAL MOTORS LIMITED

Edgware Road, The Hyde, N.W.9.

Telephone: Colindale 6541.

COMMERCIAL AND HOUSEHOLD REFRIGERATION

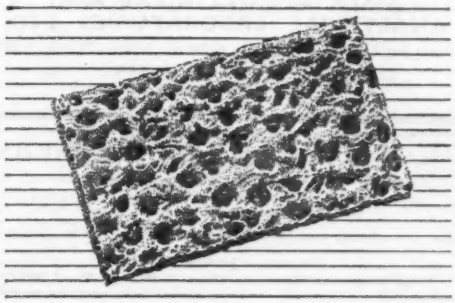
SPECIALLY FOR INVALIDS

Invalid Bovril is a particularly highly concentrated form of Bovril, prepared without seasoning, for use in the sick-room. Providing as it does the maximum concentration in the most easily assimilated form, Invalid Bovril is invaluable in promoting recovery and assisting convalescence. Costs a little more than ordinary Bovril, but goes further.

INVALID **BOVRIL**

The Essence of Convalescence

Sold by all Chemists



A palatable whole grain rye bread prepared in a form virtually free from moisture, so that complete mastication is assured. Ryvita can be eaten as an alternative to other breads. Many find that its characteristic flavour stimulates appetite. Supplies, unfortunately, are still restricted and subject to points, but we are doing our best.

RYVITA

WHEN PRESCRIBING CHLORODYNE
medical men should be particular to specify

Dr. J. Collis Browne's
CHLORODYNE

The Original and only genuine Chlorodyne

used with unvarying success by the Medical Profession in all parts of the world for over 100 YEARS

Always insist on "Dr. Collis Browne's"

THERE IS NO SUBSTITUTE

QUEEN

non-irritant Toilet Preparations specially for prescription in Allergic Cases

A complete range of toilet preparations entirely free from Orris in any of its forms or other irritants (B.M.J., Medical World, etc.). A safe alternative to suspected cosmetics. Small supplies of "QUEEN" Non-Allergic Skin Soap are now available—1/3 tablet (1 Coupon).

BOUTALLS LTD., 150, Southampton Row, London, W.C.1.

THE WORLD'S GREATEST BOOKSHOP
FOYLES
FOR BOOKS
FAMED FOR ITS EXCELLENT MEDICAL DEPT
New & Secondhand Books on every subject.
119-125 CHARING CROSS ROAD LONDON WC2
Gerrard 5660 (16 lines) Open 9-6 (inc Sats)

MICROSCOPE OUTFITS WANTED

Highest prices paid. Let us know your requirements if you wish to EXCHANGE as we may be able to help you.

DOLLONDS (L) (Estd. 1750)
191, TOTTENHAM COURT ROAD, LONDON, W.1 Tel.: MUSeum 0852

Telephone : HOLborn 1342

ASSOCIATED CLINICAL AND ANALYTICAL LABORATORIES LTD.

Staple Inn Buildings (South), 335, HIGH HOLBORN, LONDON, W.C.1

CHEMICAL ANALYSES
CLINICAL EXAMINATIONS

H. M. BENTLEY & PARTNERS

SACKVILLE HOUSE, 40, PICCADILLY, W.1

offer the Medical Profession their specialised maintenance and overhaul service for all makes of cars

Cars are collected and delivered and a replacement can be provided

Telephone our Service Dept. at:—
22-23, Grosvenor Crescent Mews, S.W.1 (SLOane 3094)

MEDICAL CORRESPONDENCE COLLEGE

19, Welbeck-street, London, W.1

Provides COACHING for all medical examinations: D.A., D.P.M., D.O.M.S., D.L.O., D.C.H., D.M.R.D. and D.M.R.T., M.R.C.P., F.R.C.S., M.D. thesis, and all qualifying examinations by a staff of highly qualified Tutors, Honoursmen, and Gold Medallists. Complete Guide to Medical Examinations sent free on application. Applicants should state in which qualification they are interested.

MALLING PLACE, KENT

For LADIES and GENTLEMEN of Unsound Mind

Terms moderate Apply to Resident Medical Superintendent
Telegrams: ADAM WEST MALLING Telephone: 3102 MALLING

WONFORD HOUSE, EXETER

A REGISTERED HOSPITAL FOR THE TREATMENT OF MENTAL DISORDERS OF THE EDUCATED CLASSES

Cases under certificate, voluntary and temporary patients, received for treatment. Modern methods of treatment available.
Terms moderate

Apply: Medical Superintendent Tel.: Exeter 2642

THE PSYCHONEUROSES & NEURASTHENIA

BOWDEN HOUSE
HARROW-ON-THE-HILL

Diagnostic Week. All patients spend the first week of their stay in undergoing a careful investigation. Clinical, pathological, and radiological diagnoses are used as routine, and each patient has at least one session of narco-analysis. For this an inclusive fee of 25 guineas is made. The patients come in with no commitment on either side for further treatment.

Those who are anxious to remain, and appear to the staff to be suitable, undergo intensive psychotherapy as before. The fees for this are 12 to 20 guineas a week, inclusive of regular specialist treatment.

Medical Director: H. CRICHTON-MILLER, M.A., M.D., F.R.C.P.
Deputy Director: GRACE H. NICOLLE, M.A., M.B.
Assistant Psychiatrist: W. A. H. STEVENSON, B.A., B.M., B.Ch.
Consulting Physician: J. BARRIE MURRAY, M.A., M.D., M.R.C.P.
Warden: Miss WINIFRED SHERWOOD, S.R.N.

ECCLESFIELD, STAPLEHURST, KENT

Home for the care and cure of Alcoholic cases (ladies). Fine mansion. 100 acres. Successful treatment. Catholic chapel on estate.

For terms apply to Sister Superior (Staplehurst 281)

HEIGHAM HALL, NORWICH

PRIVATE MENTAL HOME for Nervous and Mental Illness. All forms of treatment available. Fees from 5 gns. per week upwards, according to requirements. Vacancies occasionally exist at reduced fees on the recommendation of the patient's own physician

Apply to Dr. J. A. SMALL Telephone: Norwich 20080

THE RETREAT, YORK

The Pioneer Hospital, opened 1796, for the humane treatment of those suffering from Nervous and Mental Disorder

This Hospital of 230 beds, administered by a Committee of the Society of Friends, combines what is best in the investigation and treatment of nervous illness with a sympathetic and friendly atmosphere. In 1946 309 patients were admitted, of whom no fewer than 262 were voluntary cases.

Much curative work is accomplished in our mental hospitals to-day and the recovery rate compares very favourably with that of our general hospitals.

For information and terms of admission apply to:—
The Physician Superintendent,
ARTHUR POOL, M.R.C.P., D.P.M.
(Telephone: York 54551)

THE OLD MANOR, SALISBURY Telephone: 3216 & 3217

A Private Hospital for the Care and Treatment of those of both sexes suffering from MENTAL DISORDERS
Extensive Grounds. Detached Villas. Chapel. Garden Produce from own gardens. Terms very moderate.
CONVALESCENT HOME AT BOURNEMOUTH
standing in 12 acres of ornamental grounds, with separate villas, tennis courts, etc. Patients or Boarders may visit the Home by arrangement.
Illustrated Brochure on application to the MEDICAL SUPERINTENDENT, The Old Manor, Salisbury

CLIFFDEN, TEIGNMOUTH

For the early treatment of nervous disorders and patients needing rest and care

A well-appointed House with spacious balconies and extensive views of the South Devon Coast. Beautiful garden and own dairy in 35 acres. In the same grounds, ROWDENS, a comfortable house with lovely views. Private road to the beach
There is also a charming house, EBWORTHY, MANATON, DARTMOOR, situated in 25 acres, 1100 ft. up for bracing moorland air

Resident Physicians—BERTHA M. MULES, M.D., B.S. ANNE S. MULES, M.R.C.S., L.R.C.P. *Telephones*—TEIGNMOUTH 289 and 537

ST. ANDREW'S HOSPITAL

FOR NERVOUS AND MENTAL DISORDERS

NORTHAMPTON

PRESIDENT: THE MOST HON. THE MARQUESS OF EXETER, K.G., C.M.G., A.D.C.

MEDICAL SUPERINTENDENT: THOMAS TENNENT, M.D., F.R.C.P., D.P.H., D.P.M.

This Registered Hospital is situated in 130 acres of park and pleasure grounds. Voluntary patients, who are suffering from incipient mental disorders or who wish to prevent recurrent attacks of mental trouble; temporary patients, and certified patients of both sexes are received for treatment. Careful clinical, biochemical, bacteriological, and pathological examinations. Private rooms with special nurses, male or female, in the Hospital or in one of the numerous villas in the grounds of the various branches can be provided.

WANTAGE HOUSE

This is a Reception Hospital in detached grounds with a separate entrance, to which patients can be admitted. It is equipped with all the apparatus for the complete investigation and treatment of Mental and Nervous Disorders by the most modern methods; insulin treatment is available for suitable cases. It contains special departments for hydrotherapy by various methods, including Turkish and Russian baths, the prolonged immersion bath, Vichy Douche, Scotch Douche, Electrical baths, Plombières treatment, etc. There is an Operating Theatre, a Dental Surgery, an X-ray Room, an Ultraviolet Apparatus, and a Department for Diathermy and High-frequency treatment. It also contains Laboratories for biochemical, bacteriological, and pathological research. Psychotherapeutic treatment is employed when indicated.

MOULTON PARK

Two miles from the Main Hospital there are several branch establishments and villas situated in a park and farm of 650 acres. Milk, meat, fruit, and vegetables are supplied to the Hospital from the farm, gardens, and orchards of Moulton Park. Occupational therapy is a feature of this branch, and patients are given every facility for occupying themselves in farming, gardening, and fruit growing.

BRYN-Y-NEUADD HALL

The seaside house of St. Andrew's Hospital is beautifully situated in a park of 330 acres, at Llanfairfechan, amidst the finest scenery in North Wales. On the North-West side of the Estate a mile of sea coast forms the boundary. Patients may visit this branch for a short seaside change or for longer periods. The Hospital has its own private bathing house on the seashore. There is trout-fishing in the park.

At all the branches of the Hospital there are cricket grounds, football and hockey grounds, lawn tennis courts (grass and hard courts), croquet grounds, golf courses, and bowling greens. Ladies and gentlemen have their own gardens, and facilities are provided for handicrafts, such as carpentry, etc.

For terms and further particulars apply to the Medical Superintendent (TELEPHONE: 2356 and 2357 Northampton), who can be seen in London by appointment.

HAYDOCK LODGE

NEWTON-LE-WILLOWS, LANCASHIRE

For the reception and treatment of PRIVATE PATIENTS of both sexes of the UPPER AND MIDDLE CLASSES suffering from Mental and Nervous Disorders, Alcoholism and Drug Addiction, either voluntarily, temporarily, or under certificate. Patients are classified in separate buildings according to their mental condition. Situated in park and grounds of 400 acres. Self-supported by its own farm and gardens, in which patients are encouraged to occupy themselves. Every facility for indoor and outdoor recreation. For terms, prospectus, etc., apply MEDICAL SUPERINTENDENT. *Telephone:* Ashton-in-Makerfield 7311. *Telegraphic Address:* Wootton, Ashton-in-Makerfield.

PECKHAM HOUSE, 112, Peckham Road, London, S.E.15

Telegrams: "Alleviated, London" **Telephone: Rodney 2641-2642**

A Private Mental Hospital, for Ladies and Gentlemen suffering from Nervous and Mental Illness, where the amenities of a comfortable home are combined with full investigation and every well-established modern treatment.

Terms from £5 5s. weekly.

Illustrated Prospectus may be obtained from the Physician-Superintendent.

CAMBERWELL HOUSE, 33, Peckham Road, London, S.E.5

Telegrams: "PSYCHOLIA, LONDON" — *Telephone:* RODNEY 4343 (3 lines)

A PRIVATE HOSPITAL FOR THE TREATMENT OF MENTAL DISORDERS

Completely detached Villas for mild cases. Voluntary Patients received. Twenty acres of grounds; own garden produce. Hard and grass tennis courts, putting greens, Recreation Hall with Badminton Court, and all indoor amusements. Occupational therapy, Calisthenics, Actinotherapy, prolonged immersion baths, shock and also modified insulin treatment. Chapel.

Senior Physician, Dr. HUBERT JAMES NORMAN, assisted by a resident Medical Staff and visiting Consultants

An Illustrated Prospectus giving fees, which are reasonable, may be obtained upon application to the Secretary

The Convalescent Branch is HOVE VILLA, BRIGHTON, and is 200 ft. above sea-level

STONEYCREST NURSING HOME

(Established 1922) HINDHEAD, SURREY

850 *feet above sea level, facing South*

Medical, Surgical and Convalescent patients received Resident Masseuse

Apply, Miss D. M. Oliver, S.R.N. ('Phone: Hindhead 577)

RUTHIN CASTLE, NORTH WALES

A Private Clinic, the first in Great Britain, for investigation and treatment of all forms of disease, except infectious and mental

Nursing, dietetic, massage, x-ray and laboratory departments — Central heating and a lift to all floors

Inclusive charges — Apply SECRETARY — Telephone: Ruthin 66

HOLLOWAY SANATORIUM, VIRGINIA WATER

for the Treatment of every kind of

NERVOUS AND MENTAL DISORDER

by modern methods, after full investigation

Voluntary, Temporary and Certified Patients

The branch establishment at Canford Cliffs, Bournemouth, is reserved for the treatment of psychoneurosis and admission is without legal formality.

Fees: first two months £8 8s. per week, thereafter £6 6s. per week; single bedrooms £2 2s. per week more. Warding for insulin or prolonged narcosis treatment is counted as single-room accommodation. No other extras.

Medical Superintendent, D. N. PARFITT, M.D., M.R.C.P., D.P.M.

Appointments arranged in London or at Virginia Water

Telephone: Wentworth 2241 Telegrams: "Sanatorium, Virginia Water"

CHEADLE ROYAL CHEADLE CHESHIRE

A Registered Hospital for MENTAL DISEASES and its Seaside Branch, GLAN-Y-DON, Colwyn Bay, N. Wales

The object of this Hospital is to provide the most efficient means for the treatment and care of patients of both sexes suffering from MENTAL and NERVOUS DISEASES. The Hospital is governed by a Committee appointed by the Trustees of the Manchester Royal Infirmary.
VOLUNTARY, TEMPORARY, AND CERTIFIED PATIENTS RECEIVED

For Terms and further information apply to the MEDICAL SUPERINTENDENT *Telephone:* **GATLEY 2231**

CHISWICK HOUSE

PINNER, MIDDLESEX

Telephone: PINNER 234

A Private Hospital for the Treatment and Care of Mental and Nervous Illnesses in both Sexes.
A modern country house, 12 miles from Marble Arch, in attractive and secluded surroundings. Fees from 10 guineas per week inclusive. Cases under Certificate, Voluntary and Temporary Patients received for treatment.
DOUGLAS MACAULAY, M.D., D.P.M.

NORTHUMBERLAND HOUSE

Green Lanes, Finsbury Park, N.4

A PRIVATE HOSPITAL for the treatment of mental and nervous illnesses. Conveniently situated and easy of access from all parts. Six acres of ground, facing Finsbury Park. Voluntary and Temporary Patients received without certification. Insulin Coma Unit. E.C.T. Group Psychotherapy. Trained Resident and Visiting Staff.
Telephone: STAmford Hill 7866/7 (2 lines)
Telegrams: "Subsidiary, London"
For further particulars apply to the Medical Superintendent, ROBERT M. RIGGALL, Member, British Psycho-Analytical Society.

CITY OF LONDON MENTAL HOSPITAL

Near DARTFORD, KENT

Ladies and Gentlemen received for treatment under certificates, and without certificates as either VOLUNTARY or TEMPORARY PATIENTS, at a weekly fee of £3 3s., and upwards

THE COTSWOLD SANATORIUM

On the Cotswold Hills, seven miles from Cheltenham, Stroud and Gloucester. Fully equipped for the treatment of all forms of Tuberculosis.

Terms: from 8 guineas per week

Full particulars from MEDICAL SUPERINTENDENT, COTSWOLD SANATORIUM, CRANHAM, GLOUCESTER.
Telephone: Witcombe 2181 Telegrams: "Hoffman, Birdlip"

THE MAGHULL HOMES FOR EPILEPTICS (Inc.)
MAGHULL, Near LIVERPOOL

Open Air Occupation and Recreation for Patients, Farming, Gardening, Football, Cricket, Tennis, Bowls, etc. School recognised by Ministry of Education.

FEES—1st Class (men only)	from £3-3-0	per week
2nd Class (men and women)	£2-2-0	,,
3rd Class (men and women) supported by—		
Public Assistance Committees	35/-	,,
Education Committees	41/6	,,
Private	23/6	,,

For further particulars apply to—
C. EDGAR GRISEWOOD, A.C.A., 20 Exchange Street East, LIVERPOOL, 2

Vacancies for recent cases only

CRICHTON ROYAL, DUMFRIES

FOR NERVOUS AND MENTAL DISORDERS

Cases of Alcoholism and Drug Addiction admitted. General amenities of highest standard. Every facility for all forms of treatment, including insulin and prefrontal leucotomy. Terms moderate.
Physician-Superintendent: P. K. MCCOWAN, J.P., M.D., F.R.C.P., D.P.M., Barrister-at-Law Tel.: Dumfries 1119

SPRINGFIELD HOUSE

Phone: BEDFORD 3417 **Near BEDFORD**

For Mental Cases with or without Certificates

Fees from Six Guineas per week (including Separate Bedrooms for all suitable cases without extra charge)

For forms of admission, &c., apply to the Resident Physician, CEDRIC W. BOWER.

INTERVIEWS IN LONDON BY APPOINTMENT

UNIVERSITY EXAMINATION POSTAL INSTITUTION

17, RED LION SQUARE, LONDON, W.C.1

Over 50 years' experience

POSTAL COACHING FOR ALL MEDICAL EXAMINATIONS

MEDICAL PROSPECTUS (24 pages)

sent gratis, along with List of Tutors, &c., on application to the Secretary, 17, Red Lion Square, London, W.C.1 (Telephone: HOLborn 6312)

UNIVERSITY OF LONDON
BRITISH POSTGRADUATE MEDICAL FEDERATION

REFRESHER COURSES FOR GENERAL PRACTITIONERS
JANUARY–APRIL, 1948

Date	*No. of weeks*	*Subject*	*Hospital*
19th–23rd Jan.	1	Medicine	Lewisham L.C.C. Hospital
26th–30th Jan.	1	Obstetrics and Gynæcology	Redhill County Hospital, Edgware
23rd Feb.–5th March	2	General	Royal Northern Hospital, Holloway-road, N.7
1st April–18th June	Extended 12 afternoons	General	Hampstead General Hospital, Haverstock-hill, N.W.3

Fees: 10 guineas for 2 weeks' course; 5 guineas for 1 week and extended courses. Schemes of financial assistance are available, subject to certain conditions, for (*a*) demobilised general practitioners, (*b*) N.H.I. practitioners.
Applications for places, and further particulars, should be made to the Secretary, British Postgraduate Medical Federation, 2, Gordon-square, W.C.1. They should state if the practitioner is applying under (*a*) or (*b*) above, or not.

ROYAL COLLEGE OF PHYSICIANS OF LONDON

Sir ARTHUR MACNALTY, K.C.B., D.M., F.R.C.P., will deliver the FITZPATRICK LECTURES on TUESDAY, 9TH DECEMBER, and THURSDAY, 11TH DECEMBER, 1947, at 5 P.M. at the College, Pall Mall East, S.W.1.

Subject: "THE HISTORY OF STATE MEDICINE IN ENGLAND."

1. The Medical Department of the Local Government Board.
2. The Foundations of the National Health Services.

Any member of the Medical Profession admitted on presentation of card.

By Order of the President,
H. E. A. BOLDERO, Registrar.

THE INSTITUTE OF LARYNGOLOGY AND OTOLOGY

(in association with the
ROYAL NATIONAL THROAT, NOSE, AND EAR HOSPITAL)
330/332, Gray's Inn-road, London, W.C.1

GENERAL PRACTITIONERS' WEEK—8TH–12TH DECEMBER, 1947

During this week the teaching work of the Institute and its associated Hospital will be entirely devoted to that most helpful to those engaged in general practice.

There will be a number of lectures and clinical demonstrations, and every endeavour will be made to discuss the problems met with by general practitioners in so far as they relate to the throat, nose, and ear.

The fee for attendance during the week is £2 2s. Full syllabus from the Dean.

THE ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE

THE DIPLOMA IN INDUSTRIAL HEALTH

A Course of Instruction will be given at the institute, commencing on FRIDAY, 9TH JANUARY, 1948, for Part II of the Diploma in Industrial Health. (Those holding the C.P.H. are exempt from Part I.)

Applications for enrolment should be made at once to the Secretary, 28, Portland-place, London, W.1 (LANgham 2731/2), and from whom a prospectus and enrolment form and full details may be obtained.

EDINBURGH POST-GRADUATE BOARD FOR MEDICINE

INTERNAL MEDICINE

A course lasting 12 weeks, suitable for graduates wishing a refresher course, or to specialise in medicine, begins on MONDAY, 12TH APRIL, 1948. A similar course commences on 4TH OCTOBER, 1948. These courses consist of 300 hours' instruction comprising lectures, clinical demonstrations, and ward visits. Fee 30 guineas.

GENERAL SURGERY

The 5 months' course of Postgraduate Surgery arranged to start on Monday, 29th March, 1948, is full. A similar course will begin on MONDAY, 18TH OCTOBER, 1948, and is suitable for surgeons requiring a refresher course in the current outlook on general surgery; or for graduates preparing to specialise in surgery; approximately 280 hours of instruction are provided. Fee 35 guineas.

REFRESHER COURSE FOR GENERAL PRACTITIONERS

The 12th general fortnight refresher course, primarily for demobilised Medical Officers (Class II) and for Insurance Practitioners, will commence at 9 A.M. on MONDAY, 3RD MAY, 1948. 20 hours are devoted to lectures covering a wide range of subjects, with emphasis on recent advances in treatment. 50 hours are allotted to clinical demonstrations and ward visits. (A similar course may be held in September, 1948.) Fee for graduates not claiming expenses from Government sources, 10 guineas.

Applications for enrolment to Director of Post-Graduate Studies, University New Buildings, Edinburgh, 8. Applicants for courses in Internal Medicine and Surgery should supply particulars of qualifications and postgraduate experience.

ROFFEY PARK REHABILITATION CENTRE

HORSHAM, SUSSEX

"HEALTH AND HUMAN RELATIONS IN INDUSTRY"

Regular weekly and 2-weekly RESIDENT TRAINING COURSES given for doctors and social workers concerned with the industrial and social aspects of illness. Congenial living facilities in licensed club.

Early application to the Secretary, Training Department, Roffey Park Rehabilitation Centre, Horsham, Sussex.

HUNTERIAN SOCIETY MEDAL

The Council of the Hunterian Society have decided to revive this award. The competition is open to all general practitioners. The subject chosen for the next essay is "THE TREATMENT OF OBESITY IN GENERAL PRACTICE."

Essays must be received on or before 31st December, 1948.

Applicants are invited to apply for further details to the Hon. Secretary, J. C. AINSWORTH-DAVIS, Esq., F.R.C.S., 48, Wimpole-street, London, W.1.

L.M.S.S.A.

FINAL EXAMINATION: SURGERY, 12th January, 9th February, 8th March, 1948. MEDICINE, PATHOLOGY, 19th January, 16th February, 15th March, 1948. MIDWIFERY, 20th January, 17th February, 16th March, 1948. MASTERY OF MIDWIFERY, May and November. DIPLOMA IN INDUSTRIAL HEALTH, August and December.

For regulations apply REGISTRAR, Apothecaries' Hall, Black Friars-lane, London, E.C.4.

EXAMINING SURGEONS: Factories Act, 1937. The following appointments as Examining Surgeon under the Factories Act, 1937, are vacant. Applications should be sent to the Chief Inspector of Factories, 8, St. James's-square, London, S.W.1.

District	*County*	*Latest date for receipt of application*
CLITHEROE	LANCASTER	13TH DECEMBER, 1947
BILLESDON	LEICESTER	13TH DECEMBER, 1947
BEAULY	INVERNESS	13TH DECEMBER, 1947
SLEAFORD	LINCOLN	13TH DECEMBER, 1947

UNIVERSITY COLLEGE HOSPITAL, Gower-street, W.C.1. HONORARY ASSISTANT ANÆSTHETIST.

Applications (50 copies), accompanied by such evidence in support of his candidature as applicant thinks fit to submit, with the names of 3 referees, should reach Secretary by 19th December, 1947.

UNIVERSITY COLLEGE HOSPITAL, Gower-street, W.C.1. HONORARY ASSISTANT SURGEON to the Royal Ear Hospital (E.N.T. Dept. of University College Hospital).

Applications (50 copies), accompanied by such evidence as the candidate thinks fit to submit in support of his candidature, and names of 3 referees, to Secretary by 31st December, 1947.

UNIVERSITY COLLEGE HOSPITAL, Gower-street, W.C.1. ANÆSTHETICS REGISTRAR (B1). Salary £600, non-resident. Applicants should hold the D.A.

Applications, with the names of 3 referees, to reach the Secretary by 12th December, 1947.

THE HOSPITAL FOR SICK CHILDREN, Great Ormond-street, London, W.C.1.

OUTPATIENT MEDICAL REGISTRAR (part time), 4 morning sessions a week, commencing 16th February, 1948. Salary £300 p.a.

OUTPATIENT MEDICAL REGISTRAR (part time), 4 morning sessions a week, commencing 15th March, 1948. Salary £300 p.a.

Appointments, which are renewable, are tenable in the first instance for 1 year. Selected applicants required to call upon members of the Visiting Medical Staff and to furnish them with a copy of their application, supported by 3 testimonials, given specially for the purpose.

Further particulars and forms of application, which must be returned not later than 31st December, 1947, are obtainable from: H. F. RUTHERFORD, House Governor.

November, 1947.

INSTITUTE OF CARDIOLOGY, National Heart Hospital, Westmoreland-street, W.1. SENIOR RESEARCH FELLOW to above Institute. This newly created Fellowship tenable for 3 years, but reviewed annually. Salary £1000 p.a. Applicants, who should have had considerable experience in research methods, will be expected to call on members of the Academic Board.

Applications, addressed to the Dean, should be submitted by 1st February, 1948.

THE ROYAL MASONIC HOSPITAL, Ravenscourt Park, London, W.6. Vacancy for GYNÆCOLOGIST on Surgical Staff caused by the recent death of Mr. L. Carnac Rivett. Applications invited from Fellows of the Royal College of Surgeons of England. Candidates must be engaged in consulting practice, well established in their profession, and be members of the senior staff of a recognised London teaching or special hospital. Retiring age is 60; the number of beds in the Hospital is approximately 200.

Application should be made to the Joint Honorary Secretaries at the Royal Masonic Hospital.

WEST LONDON HOSPITAL, Hammersmith, W.6. (242 Beds.) RESIDENT HOUSE SURGEON (General and Genito-Urinary), vacant 1st January, 1948 (Male or Female). 6 months' appointment, may be terminated by 1 month's notice on either side. Salary at rate of £100 a year, with usual residential emoluments.

Applications, with particulars of age, nationality, medical school, qualifications with dates, and experience, accompanied by 3 testimonials (copies), should reach undersigned by first post, Monday, 8th December, 1947.

C. R. LOCKHART, Secretary.

THE MEDICAL COLLEGE OF ST. BARTHOLOMEW'S HOSPITAL, in the City of London, West Smithfield, E.C.1. DEMONSTRATOR in Dept. of Biochemistry and Chemistry at commencing salary of £500 p.a.; there is a family allowance scheme in operation. 2 vacancies, 1 will be filled by an applicant with special interest in physical chemistry. It is hoped that successful applicant will be able to commence duties 1st January, 1948, or as soon as possible thereafter.

Applications to the Dean of the Medical College, from whom further particulars may be obtained.

COUNTY BOROUGH OF WEST HAM. Whipps Cross Hospital, Leytonstone, E.11. CASUALTY OFFICER. Previous experience of this type of work an advantage. Appointment for 1 year in the first instance. Salary £650 p.a., annual increments £25 to £850 p.a., full emoluments and temporary bonus.

Further particulars and application forms from M.O.H., 223/225, Romford-road, West Ham, London, E.7, returnable to him by 11th December, 1947. E. E. KING, Town Clerk.

West Ham Town Hall, Stratford, London, E.15,
14th November, 1947.

LONDON SCHOOL HEALTH SERVICE. The London County Council invites applications for appointment as ASSISTANT MEDICAL OFFICER on the central medical staff of the Public Health Dept. Salary £780–£25–£930 a year, together with cost-of-living addition. There are no emoluments. The duties primarily those in connexion with child health. An advantage if candidate is recognised by the Ministry of Education for the purpose of ascertaining educationally subnormal pupils and had special experience in mental deficiency.

Forms of application (stamped addressed envelope necessary) obtainable from School Medical Officer (S.D.5.), The County Hall, Westminster Bridge, S.E.1, and be returned on 14th December, 1947. Canvassing disqualifies. (3646.)

MEMORIAL HOSPITAL, Shooters Hill, London, S.E.18. (General Hospital—130 Beds.) Board of Management invites applications for post of HONORARY ANÆSTHETIST (temporary).

Applications to House Governor.

MEMORIAL HOSPITAL, Shooters Hill, London, S.E.18. (General Hospital—130 Beds.) CASUALTY OFFICER (A). Salary £175 p.a., full residential emoluments. To R practitioners appointment limited to 6 months.

Applications, with copies of 3 recent testimonials, to House Governor.

ROYAL FREE HOSPITAL, Gray's Inn-road, London, W.C.1.
(*a*) ORTHOPÆDIC HOUSE SURGEON (B2) Male or Female.

(*b*) RESIDENT MEDICAL OFFICER (B2), Male or Female, at Royal Free Hospital, Liverpool-road Branch, Liverpool-road, N.1, for 6 months in first place, from 1st February, 1948. Duties include care of private wards.

(*c*) OBSTETRIC HOUSE SURGEON (B2), Female (with some gynæcological work). Salary £150 p.a.

(*d*) E.N.T. HOUSE SURGEON (B2), Male or Female.

Appointments (*a*), (*c*), and (*d*) for 6 months from 1st January, 1948, and graduates from Royal Free Hospital School of Medicine are given first consideration. Appointments (*a*), (*b*), and (*d*) salary £150 p.a., resident.

Applications, stating age, qualifications, with copies of 3 recent testimonials, and photograph, by 5th December, 1947, to—
R. G. HEPPELL, A.C.A., House Governor.

ST. MARY'S HOSPITAL FOR WOMEN AND CHILDREN, Upper-road, Plaistow, E.13. CASUALTY OFFICER AND RESIDENT ANÆSTHETIST (B2). Salary £225 p.a., residential emoluments. To R practitioners appointment limited to 6 months.

Applications, with copies of recent testimonials, to Secretary.

THE QUEEN ELIZABETH HOSPITAL FOR CHILDREN, Hackney-road, London, E.2. HOUSE PHYSICIAN-CASUALTY OFFICER (B2), vacant 4th January, 1948. Appointment will be for 6 months. Salary at rate of £150 p.a., full residential emoluments.

Application forms may be obtained from the undersigned and should be returned, with not more than 3 testimonials (copies), by 13th December, 1947.
CHARLES H. BESSELL, General Secretary.

THE MEDICAL COLLEGE OF ST. BARTHOLOMEW'S HOSPITAL, West Smithfield, London, E.C.1. BIOCHEMIST to Dermatological Dept. at commencing salary of £500 p.a. Family allowance scheme in operation.

Applications should be received not later than 15th December, 1947, and addressed to Dean of the Medical College, from whom further particulars may be obtained.

EAST HAM MEMORIAL HOSPITAL, Shrewsbury-road, London, E.7. RESIDENT OBSTETRIC OFFICER (B1), vacant 1st January, 1948. Appointment for 6 months in the first instance, but successful candidate eligible for reappointment for further period of 6 months. Salary £250 p.a., board, residence, and laundry.

Applications, stating age, experience, and full particulars, with copies of 3 recent testimonials, by 10th December, 1947, to: REGINALD PERRY, Secretary-Superintendent.

THE ROYAL CANCER HOSPITAL (FREE) (Incorporated under Royal Charter), Fulham-road, London, S.W.3. RESIDENT ASSISTANT PATHOLOGIST. Experience in clinical pathology essential. Salary £500 p.a.

Applications, on form supplied by the Secretary, together with 3 recent testimonials (copies), to be sent to the Secretary by first post Friday, 12th December, 1947.
VICTOR H. PINKHAM, Secretary.

THE ROYAL CANCER HOSPITAL (FREE) (Incorporated under Royal Charter), Fulham-road, London, S.W.3. Part-time SURGICAL REGISTRAR. Candidates must be duly qualified and registered under Medical Act and engaged in consulting practice only. Preference given to those holding diploma F.R.C.S. (Eng.). Appointment for 1 year, subject to re-election for maximum of 3 years. Remuneration £500 p.a. Successful candidate required to attend minimum of 5 half-days per week. Copy of rules and further information obtainable from Secretary.

Applications, on form available from Secretary, with 1–3 recent testimonials (copies), by first post 3rd December, 1947, to: VICTOR H. PINKHAM, Secretary.

THE MOTHER'S HOSPITAL OF THE SALVATION ARMY. (107 Beds.) RESIDENT OBSTETRIC REGISTRAR, vacant 1st February, 1948. Appointment full time for 1 year in first instance. Previous obstetric experience essential. Salary according to experience with minimum £350 p.a. plus board, residence, and laundry.

Applications as soon as possible to the Secretary-Superintendent, Mother's Hospital, Clapton, E.5.

THE GORDON HOSPITAL for Rectal and Gastro-intestinal Diseases, Vauxhall Bridge-road, London, S.W.1. HOUSE PHYSICIAN (B2), vacant 1st January, 1948, for 6 months. Applicants should preferably have experience in administration of anæsthetics. Salary £250 p.a., full residential emoluments.

Applications, with copies of 2 recent testimonials, by 5th December, to: R. E. LAWSON, House Governor and Secretary.

BOLINGBROKE HOSPITAL, Wandsworth Common, S.W.11. RADIOLOGIST, vacant 1st January, 1948. Candidates must hold D.M.R.E. and required to attend up to a weekly maximum of 4 sessions of 1¼–2½ hours each, for which fee of 4 guineas per session paid.

Applications, with copies of 3 testimonials, by 6th December, 1947, to: R. G. FERRIS, Secretary-Superintendent.

CHARING CROSS HOSPITAL. Honorary Clinical Assistant to Diagnostic Radiology Dept. Honorarium £50 p.a. Candidates should have, by preference, the qualification of D.M.R.E.

Applications, with copies of 3 recent testimonials, by first post, 1st December, 1947, to: GEORGE J. JONES, Secretary.

CHARING CROSS HOSPITAL. Medical Registrar (B1) (resident), Male. Minimum commencing salary £350 p.a.

Applications, with copies of 3 testimonials, by first post, 1st December, 1947. GEORGE J. JONES, Secretary.

THE NATIONAL HOSPITAL FOR NERVOUS DISEASES, Queen-square, London, W.C.1. HONORARY ASSISTANT PHYSICIAN. Candidates should be Members or Fellows of the Royal College of Physicians. Doctors serving in H.M. Forces invited to apply.

Applications by 6th December, 1947, to—
H. EWART MITCHELL, Secretary.

THE PRINCE OF WALES'S GENERAL HOSPITAL, London, N.15. (238 Beds.) SURGICAL REGISTRAR. Applicants must be Fellows of the Royal College of Surgeons of England. Appointment whole time for 6 months. Salary £1000 p.a.

Applications, stating age, qualifications, and experience, with recent testimonials, by 8th December, 1947, to—
J. C. BURDETT, Director and House Governor.

THE PRINCE OF WALES'S GENERAL HOSPITAL, London, N.15. CASUALTY OFFICER (A). Male. Appointment for 6 months. Salary £120 p.a., full residential emoluments.

Applications should be sent by 1st January, 1948, to—
J. C. BURDETT, Director and House Governor.

MAUDSLEY HOSPITAL (University of London), Denmark Hill, S.E.5. HOUSE PHYSICIAN, 5 posts: vacancies arise quarterly. Appointment tenable for 6 months in the first instance. Salary £339 a year (£2 9s. per week is charged for board, lodging, and laundry).

Applications, giving full particulars of candidate's age, qualifications, and experience, should be made for forthcoming vacancies to Acting Medical Superintendent, Maudsley Hospital, Denmark Hill, S.E.5, before 30th November, 1947. (3633.)

CONNAUGHT HOSPITAL, Walthamstow, E.17. Temporary CLINICAL ASSISTANT for outpatients to attend 1 session per week (Thursday). Sessional fee of £2 12s. 6d. attaches to the appointment. Candidates must hold the Membership of one of the Royal Colleges of Physicians.

Application, with names of 2 referees, must be received not later than 10th December addressed to—
R. HALTON HARRISON, General Secretary.

CONNAUGHT HOSPITAL, E.17. (Voluntary Hospital—120 Beds.) HOUSE SURGEON (A), Male, vacant 1st January, 1948. Salary £120 p.a., board-residence.

Applications should be sent not later than 10th December to—
R. HALTON HARRISON, General Secretary.

LONDON CHEST HOSPITAL, E.2. Applications are invited for the post of ASSISTANT TUBERCULOSIS OFFICER (whole time) in connexion with the Tuberculosis Dispensary for the Metropolitan Boroughs of Bethnal Green and Hackney established at the Hospital. Dispensary under the control of a Joint Committee and the Board of Management of the Hospital. Applicants must have held a resident appointment in a general hospital, have had special experience in the treatment and diagnosis of tuberculosis, and be not over 35 years of age. Commencing salary £700, annual increments of £25 to £900. Successful candidate required to take up duty in January and appointment terminable by 3 months' notice on either side.

Applications, with copies of 3 testimonials, must be received by 20th December, 1947. Canvassing prohibited, except as regards members of the Medical Staff of the Hospital, who will advise on the applications. THOMAS BROWN, Secretary.

BOROUGH OF WILLESDEN. Willesden Maternity Hospital, Honeypot-lane, N.W.9 (57 Beds). FIRST OBSTETRIC ASSISTANT. Applicants must have considerable obstetric experience. Salary £600 p.a., rising to £800 p.a. by annual increments of £50, plus board, residence, and laundry. Married quarters available. Appointee will, in addition to clinical duties, be responsible for the administration of the Hospital.

Further details and application form obtainable from M.O.H., 54, Winchester-avenue, N.W.6, to whom they should be returned by 18th December, 1947. R. S. FORSTER, Town Clerk.

Town Hall, Dyne-road, Kilburn, N.W.6.

MIDDLESEX COUNTY COUNCIL. Central Middlesex County HOSPITAL, Park Royal, N.W.10. SURGEON required. Higher surgical qualification and good experience in general surgery with special experience in treatment of fractures. General scope of duties, arranged by Medical Director, may include teaching. Inclusive salary £1200 (plus any temporary bonus, now £60 p.a.) by £100 to £1800; on proof of outstanding achievement increments of £50 to £2200 may be granted. First increment not payable until 1st April following completion of 6 months' service. Exceptional circumstances may justify appointing above minimum. Non-resident, but required to live near Hospital, and to undertake to act as Deputy Medical Director for a period if called upon. Whole time, established and pensionable, subject to medical examination.

Applications to undersigned by 6th December, 1947, stating age, qualifications, experience, names of 3 referees (quoting D.95.L.). No forms.
C. W. RADCLIFFE, Clerk of the County Council.
Middlesex Guildhall, S.W.1.

MIDDLESEX COUNTY COUNCIL. Hillingdon County Hospital, near UXBRIDGE, MIDDLESEX. CHIEF ASSISTANT IN MEDICINE required. Higher qualification in medicine. General scope of duties, arranged by Medical Director, may include teaching. Appointment up to 3 years, possible extension; subject to medical examination. Inclusive salary £750 p.a., by £50 to £950 p.a., plus any temporary bonus (now £60 p.a.). First increment payable from 1st April following 6 months' service. Whole-time, non-resident post, vacant 1st January, 1948. Required to live near Hospital. Further particulars from Medical Director.

Applications to undersigned by 13th December, 1947, stating age, qualifications, experience, with copies of 2 recent testimonials and names of 2 referees (quoting D.136.L.). No forms.
C. W. RADCLIFFE, Clerk of the County Council.
Middlesex Guildhall, S.W.1.

MIDDLESEX COUNTY COUNCIL. Senior House Surgeon (resident, B2, Male) for Hillingdon County Hospital, near Uxbridge, Middlesex. Salary £250 p.a., plus any temporary bonus (now £30 p.a., cash). Board, lodging, laundry. Whole time; 6 months' appointment, may be extended except in case of R practitioners. Vacant end of January, 1948.

Applications, stating age, qualifications, experience, with copies 1–3 recent testimonials, to Medical Director of Hospital by 6th December, 1947 (quoting D.93.L.). No forms.
C. W. RADCLIFFE, Clerk of the County Council.
Middlesex Guildhall, S.W.1.

MIDDLESEX COUNTY COUNCIL. Harefield County Hospital, HAREFIELD. MEDICAL OFFICER (B1) required. Treatment for all forms of tuberculosis in adults and children. Opportunity provided for study of non-tuberculous chest conditions (Thoracic Unit, 100 Beds; Observation Ward, 18 Beds). Must have held house appointments; chest diseases and sanatorium experience desirable. Appointment 1–3 years. Whole time, duties may include teaching, under general supervision of Medical Director. Inclusive salary £520 p.a., plus any temporary bonus (now £60 p.a.; £30 only cash if resident); if extended, increments of £50 p.a. to £620 p.a. Board, lodging, laundry. Provision to become non-resident may be given by Hospital Committee; payment of £150 p.a. in lieu of residential emoluments, first increment payable from 1st April following 6 months' service. Subject to medical examination.

Applications, stating age, qualifications, experience, to undersigned by 13th December, 1947, with copies of up to 3 recent testimonials (quoting D.130.L.). No forms.

C. W. RADCLIFFE, Clerk of the County Council.

Middlesex Guildhall, S.W.1.

MIDDLESEX COUNTY COUNCIL. Ashford County Hospital, ASHFORD, MIDDLESEX. (Developed from Emergency Hospital with accommodation for 600 mainly acute patients; Outpatient Dept., and number of Special Depts.) CHIEF ASSISTANT IN MEDICINE required. Higher qualification in medicine and experienced. General scope of duties, arranged by Medical Director, may include teaching. Appointment initially for 3 years, subject to medical examination. Inclusive salary £750–£50–£950 p.a., plus any temporary bonus (now £60 p.a.). First increment not payable until 1st April following completion of 6 months' service. Whole time, established, non-resident but required to live near Hospital.

Applications to undersigned, stating age, qualifications, experience, with copies of up to 2 recent testimonials and names of 2 referees by 6th December, 1947 (quoting D.94.L.). No forms.

C. W. RADCLIFFE, Clerk of the County Council.

Middlesex Guildhall, S.W.1.

MIDDLESEX COUNTY COUNCIL. House Surgeon (resident, A, Male) for Ashford County Hospital, Ashford, Middlesex, general surgical wards. Salary £150 p.a., plus any temporary bonus (now £30 p.a., cash), board, lodging, laundry. 6 months' appointment. Vacant now.

Applications, stating age, qualifications, experience, with copies of up to 3 recent testimonials, to Medical Director of Hospital immediately (quoting D.131.L.). No forms.

C. W. RADCLIFFE, Clerk of the County Council.

Middlesex Guildhall, S.W.1.

MIDDLESEX COUNTY COUNCIL. North Middlesex County HOSPITAL, Edmonton, N.18. RADIOLOGY DEPARTMENT. CHIEF ASSISTANT with D.M.R.E. required. Consultant Visiting Radiologist in charge. Facilities granted for postgraduate study. General scope of duties, may include teaching, arranged by Medical Director. Whole time, probable 18 months' appointment, owing to call-up of holder. Vacant 1st January, 1948. Subject to medical examination. Commencing inclusive salary £750 p.a., plus any temporary bonus (now £60 p.a.); if extended, annual increments of £50 to £950 p.a. First increment payable from 1st April following 6 months' service. Non-resident, but required to live near Hospital.

Applications to undersigned, stating age, qualifications, experience, with copies of up to 2 recent testimonials and names of 2 referees by 13th December (quoting D.129.L.). No forms.

C. W. RADCLIFFE, Clerk of the County Council.

Middlesex Guildhall, S.W.1.

MIDDLESEX COUNTY COUNCIL. Junior House Surgeon (A) required at Chase Farm Hospital, Enfield, Middlesex, for general surgical duties. Salary £150 p.a., plus any temporary bonus (now £30 p.a., cash). Board, lodging, laundry. 6 months' appointment. Vacant 23rd December, 1947.

Applications, stating age, qualifications, experience, with copies of up to 3 recent testimonials, to Medical Director by 13th December, 1947 (quoting D.135.L.). No forms.

C. W. RADCLIFFE, Clerk of the County Council.

Middlesex Guildhall, S.W.1.

CHASE FARM HOSPITAL, Enfield, Middlesex. Pathologist with special experience of histology to work in the laboratory at the above Hospital. The post is in the Emergency Medical Service under the Ministry of Health and on salary range of £1000–£1400 p.a., payable by the Ministry. This salary is assessed on a non-resident basis and will be at rate of £100 p.a. less if full board and lodging provided at expense of Hospital. Appointment terminable by a month's notice on either side.

Applications, stating age, qualifications with dates, present appointment, if any, previous experience, and 3 recent testimonials, should be addressed to Medical Superintendent, Chase Farm Hospital, The Ridgeway, Enfield, Middlesex, not later than 20th December, 1947.

AMENDED ADVERTISEMENT

BOROUGH OF EALING. Assistant Medical Officer of Health (Male, resident). Salary £700 p.a., plus board and residence valued at £150 p.a., cost-of-living bonus at present £29 18s. p.a. Appointee required to reside at Clayponds Isolation Hospital, South Ealing, and to act as medical attendant on patients in that Hospital. Previous experience in treatment of cases of infectious disease essential. Board and furnished rooms provided at Hospital. Person appointed also required to carry out maternity and child welfare work, medical inspection of school children, and perform such other duties as may be allocated as assistant to the Medical Officer of Health. Required to devote his whole time to the duties and private practice not allowed.

Application forms and terms of appointment obtainable from M.O.H., Town Hall, Ealing, W.5, to whom applications, with copies of 1–3 recent testimonials, should be submitted by 13th December, 1947. E. J. COPE-BROWN, Town Clerk.

Town Hall, Ealing, W.5.

MIDDLESEX COUNTY COUNCIL. Hillingdon County Hospital and HAREFIELD COUNTY HOSPITAL, near UXBRIDGE, MIDDLESEX. THORACIC SURGEON required. Higher degree or diploma in surgery and extensive experience in thoracic surgery. To divide time equally between the 2 Hospitals and available as consultant in thoracic surgery to other Middlesex County Hospitals as may be necessary. General scope of duties, may include teaching, arranged by Medical Directors of Hospitals. Inclusive salary £1200, plus any temporary bonus (now £60 p.a.), by £100 to £1800 p.a.; on proof of outstanding achievement increments of £50 to £2200 p.a. may be granted. Exceptional circumstances may justify appointing above minimum. First increment not payable until 1st April following completion of 6 months' service. Whole time, established, and pensionable subject to medical examination. Non-resident, but required to live near Hospitals. Further details from Medical Directors.

Applications, stating age, qualifications, experience, with copies of up to 3 recent testimonials, to undersigned by 6th December, 1947 (quoting D.102.L.). No forms.

C. W. RADCLIFFE, Clerk of the County Council.

Middlesex Guildhall, S.W.1.

WEST HAM MENTAL HOSPITAL, Goodmayes, Ilford. Junior ASSISTANT MEDICAL OFFICER. Salary £455, annual increments £25 to £555 p.a., plus war bonus, full residential emoluments valued for superannuation purposes at £150 p.a. Hospital situated within easy access to centre of London. Opportunities for postgraduate study.

Applications to Medical Superintendent as soon as possible.

KING GEORGE HOSPITAL, Ilford. House Surgeon (A), Male or Female, vacant 1st January, 1948. Appointment for 6 months. Salary £180 p.a., full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, with copies of 3 recent testimonials, as soon as possible to: T. J. ROSE, Deputy Secretary.

ESSEX COUNTY COUNCIL. Oldchurch County Hospital, ROMFORD. HOUSE OFFICER in the Orthopædic Dept. Salary £260 a year, plus residential emoluments and bonus. To R practitioners appointment limited to 6 months. Members of H.M. Forces may apply.

Applications, indicating age, whether married, qualifications, experience, and position in relation to military service, with copies of 1–3 recent testimonials, to Medical Superintendent as soon as possible.

TILBURY HOSPITAL, Tilbury, Essex. Resident Casualty Officer AND GYNÆCOLOGICAL HOUSE SURGEON (B2), vacant 1st December. Salary £150 p.a., full residential emoluments. To R practitioners appointment for 6 months.

Applications, stating age and qualifications with dates, to the Secretary.

ESSEX COUNTY HOSPITAL, Colchester. (224 Beds.) Required, CASUALTY OFFICER AND HOUSE SURGEON (A) for a term of 6 months. Salary £170 p.a., resident.

Apply, with testimonials, to the Secretary.

BAGULEY EMERGENCY HOSPITAL. Surgical Registrar for Thoracic Unit. Applicants must hold higher surgical qualifications. Successful candidate will work under direction of the Director of the Chest Unit—Mr. Graham Bryce, F.R.C.S. This Unit is the Regional Surgical Centre for non-tuberculous cases and every facility will be available for appointee to work on and gain experience in these cases. Appointment full time in the Emergency Medical Service under the Ministry of Health and tenable for an initial period of 6 months, with a salary range of £750–£1000 p.a. If appointment is continued beyond 6 months, the post will be upgraded to a salary range of £1000 and £1400 p.a. Both these ranges are on a non-resident basis and the salary £100 p.a. less if full board and lodging are provided. Salary paid by the Ministry of Health and appointment terminable by 1 month's notice on either side.

Applications, stating present appointment if any, giving full details of experience, with copies of 2 testimonials, to Medical Superintendent, Baguley Emergency Hospital, by 20th December, 1947.

NEW SUSSEX HOSPITAL FOR WOMEN AND CHILDREN, BRIGHTON (Incorp.), Windlesham-road, BRIGHTON, 1. (Officered by Women Doctors.) HOUSE SURGEON (B2), Female, general surgery and gynæcology. Salary £150 p.a. Duties commence 1st December, 1947, for 6 months.

Applications, with age, nationality, qualifications, experience, and copies of recent testimonials, immediately to—

PERCY F. SPOONER, Secretary.

THE ROYAL PORTSMOUTH HOSPITAL. House Physician (B2) (Male), vacant about 1st December, 1947. Salary £225 p.a., full residential emoluments. 6 months' appointment.

Applications, stating age, qualifications, and nationality, immediately to: G. A. HUGHES, Secretary.

THE ROYAL PORTSMOUTH HOSPITAL. Medical Registrar (non-resident). Applicants to be demobilised Medical Officers (Class III). Candidates should possess Membership of the Royal College of Physicians. Salary £650 p.a. For 6 months in first instance.

Applications, stating age, nationality, full details of experience, with copies of 3 recent testimonials, as soon as possible to—

G. A. HUGHES, Secretary.

THE ROYAL PORTSMOUTH HOSPITAL. (255 Beds.) Honorary ASSISTANT ANÆSTHETIST.

Applications, stating full details of career and experience, and giving names of 3 referees, by 20th December, 1947, to—

G. A. HUGHES, Secretary.

KETTERING AND DISTRICT GENERAL HOSPITAL. House PHYSICIAN (B2). Post for 6 months. Salary £250 p.a., full residential emoluments.

Applications, stating age, qualifications with dates, nationality, with copies of 3 recent testimonials, as soon as possible to—

G. W. JACKSON, Secretary-Superintendent.

24th November, 1947.

SURREY COUNTY COUNCIL. Botleys Park, Chertsey. Junior ASSISTANT MEDICAL OFFICER (Male or Female) at above Certified Institution. Applicants must be interested in treatment of mental deficiency. Colony is modern of about 1350 Beds, with fully-equipped Hospital Block, Operating-theatre, Laboratory, and X-ray Dept., Adult and Juvenile Occupational Centres, and all facilities for the care, treatment, and study of mental defectives of both sexes, all ages and grades. Recognised by London University for the D.P.M. (Mental Deficiency). Salary £400 p.a., plus bonus (£59 16s.), full residential emoluments. Post tenable for 6 months in first instance, and renewable for further 6 months to maximum 1 year.

Applicants should have held post of House Physician or House Surgeon in a general hospital.

Applications to the Physician-Superintendent.

SURREY COUNTY COUNCIL. Farnham County Hospital, Hale-road, FARNHAM. ASSISTANT MEDICAL OFFICER (B2). Candidates must have had experience in a house appointment. Salary £250 p.a., plus bonus and full residential emoluments valued at £150 p.a. To R practitioners appointment limited to 6 months; otherwise renewable for further 6 months.

Applications by letter, stating age, qualifications, experience, and present appointment, with 1–3 recent testimonials (copies), to Medical Superintendent of Hospital by 13th December, 1947.

ROYAL SURREY COUNTY HOSPITAL, Guildford. (229 Beds.) HOUSE SURGEON (A) for Orthopædic and General Surgery, vacant 31st December. Appointment, which is recognised in connexion with the F.R.C.S. examination, is for 6 months. Salary £175 p.a., full residential emoluments.

Applications, stating age, nationality, qualifications, and experience, with copies of 1–3 testimonials, to Secretary-Superintendent before 13th December.

THE CASSEL HOSPITAL for Functional Nervous Disorders, HAM COMMON, RICHMOND, SURREY. Following war-time evacuation this Hospital is now permanently established at the above address with increased accommodation.

PHYSICIAN, whole time. Salary £1200–£1500 p.a., according to qualifications. Residential emoluments or cash in lieu.

PHYSICIAN, part time. 2 posts may be offered. The Physician will be required to attend the Hospital 6 sessions of 3½ hours per week. Salary £600–£750, according to qualifications.

Applicants for the posts of Physician must be psychiatrists of experience with special interest in neurosis.

REGISTRARS. 2 whole-time posts offered. Salary £750, with residence or cash in lieu. Applicants should be possessed of relevant experience in the psychiatry of neurosis, and the possession of a D.P.M. would be an advantage.

If successful applicants for any of the above posts are participants in a superannuation scheme, superannuation facilities will be offered; otherwise, pending the National Health Service the posts will not be superannuated.

Applications to the Secretary by 22nd December, 1947, at above address, giving names of 3 referees.

THE RADCLIFFE INFIRMARY, Oxford. Surgical Registrar (B1), vacant 1st February, 1948. Applicants should have held house appointments and had surgical experience. Preference given to candidates holding diploma of F.R.C.S. Salary £600 p.a., non-resident, but appointee required to live in the Hospital while the Firm to which he is attached is on emergency call.

Applications, stating age, full christian names, nationality, qualifications with dates, experience and details of previous appointments, and names of 3 referees to undersigned, from whom further particulars can be obtained, by 13th December.

A. G. E. SANCTUARY, Administrator.

CITY OF LEEDS. Public Health Department. Killingbeck Sanatorium. (242 Beds.) DEPUTY MEDICAL SUPERINTENDENT. Sanatorium treats male and female pulmonary tuberculosis and there is an active Thoracic Surgery Unit attached. Previous experience in the treatment of pulmonary tuberculosis is essential and successful applicant required to undertake such other general medical duties as are assigned to him by the Medical Superintendent. Commencing salary £700 and the maximum £800 p.a., plus cost-of-living bonus, board, residence, and laundry, these emoluments being valued for superannuation purposes at £120 p.a. There is no accommodation for married men and therefore if non-resident the value of emoluments paid in cash. All fees received must be paid into the City funds. Officer appointed required to pass medical examination and to contribute to Local Government Superannuation Scheme.

Forms of application obtainable from undersigned, to whom applications, endorsed "Deputy Medical Superintendent, Killingbeck Sanatorium," with names and addresses of 3 referees, should be forwarded by 12 NOON, 20th December, 1947. Canvassing in any form, either directly or indirectly, will be a disqualification.

I. G. DAVIES,
Medical Officer of Health, School Medical Officer.

Public Health Department (Hospitals Administration Section), 12, Market Buildings, Vicar-lane, Leeds, 1.

THE GENERAL INFIRMARY AT LEEDS. Orthopædic Registrar (B1) (non-resident). Applicants should have held house appointments and had surgical experience. Previous experience in orthopædic surgery essential. Preference given to candidates holding diploma of F.R.C.S. England. Salary £400–£600 p.a., according to experience.

Applications to be received by the undersigned not later than 12th December, 1947.

S. CLAYTON FRYERS, House Governor and Secretary.

THE BOLTON ROYAL INFIRMARY. (245 Beds—Resident Medical Staff 7.) RESIDENT ANÆSTHETIST (B2). Suitable post in preparation for D.A. qualification. Salary £225 p.a., full residential emoluments. To R practitioners appointment limited to 6 months.

Applications, stating age, nationality, and experience, with copies of testimonials, as soon as possible to—

H. P. TRAVIS, General Superintendent.

24th November, 1947.

KENT EDUCATION COMMITTEE. Child Guidance Division of the School Health Service. SENIOR ASSISTANT COUNTY MEDICAL OFFICER on the central medical staff of the Committee. Successful candidate responsible to School Medical Officer for general conduct of the Child Guidance Service and required to undertake clinical duties in that Service. Salary £1110 a year, biennial increments £50 to £1210, and commencing point fixed according to qualifications and experience. Cost-of-living allowance also payable. Members of H.M. Forces may apply. Appointment superannuable and successful candidate required to pass medical examination and provide car, for which travelling allowance paid on County Council's scale.

Applications, stating age, qualifications, and experience, names and addresses of 2 persons as reference to professional ability and character, addressed to undersigned by 11th December, 1947. No application forms.

A. ELLIOTT, School Medical Officer.

Public Health Dept., County Hall, Maidstone,
7th November, 1947.

KENT COUNTY COUNCIL. Senior Assistant County Medical OFFICER for Mental Health Services on central staff of Public Health Dept. Successful candidate responsible to County Medical Officer for general conduct of Mental Health Services of the Health Committee as prescribed in the National Health Service Act, 1946, and required to undertake clinical duties, particularly in connection with mental defectives. Salary £1110 a year, biennial increments £50 to £1210, and commencing point fixed according to qualifications and experience. Cost-of-living allowance also payable. Members of H.M. Forces may apply. Appointment superannuable and successful candidate required to pass medical examination and provide car, for which travelling allowance paid on County Council's scale.

Applications, stating age, qualifications, and experience, names and addresses of 2 persons as reference to professional ability and character, addressed to County Medical Officer, P.H. Dept., County Hall, Maidstone, by 11th December, 1947. No application forms.

W. L. PLATTS, Clerk of the County Council.

County Hall, Maidstone, 7th November, 1947.

KENT COUNTY COUNCIL. County Hospital, Chatham. Resident ASSISTANT MEDICAL OFFICER (B2). Duties primarily those of House Physician. Salary £200 a year, full residential emoluments plus cost-of-living bonus. To R practitioners appointment limited to 6 months, otherwise will not exceed 1 year.

Applications, stating age, qualifications, experience, and names and addresses of 2 persons as reference to professional ability, addressed to Medical Superintendent, by 9th December 1947. W. L. PLATTS, Clerk of the County Council.

County Hall, Maidstone, 15th November, 1947.

KENT COUNTY MENTAL HOSPITAL, Chartham Down, near CANTERBURY. FIRST ASSISTANT MEDICAL OFFICER (B1). Male, whole time. Candidates must have previous experience in psychiatry. Salary £826 p.a., by 1 annual increment £25 to £851, with additional £50 for D.P.M., plus cost-of-living war addition £59 16s. House available on Hospital estate for which a reasonable rent charged.

Applications, with copies of 3 recent testimonials, by 6th December to Medical Superintendent.

KENT COUNTY OPHTHALMIC AND AURAL HOSPITAL, MAIDSTONE. (114 Beds.) HOUSE SURGEON (B1) to E.N.T. Dept., vacant 1st January, 1948. Applicants must be unmarried and should have had experience in the specialty. The Hospital is fully recognised by the Examining Board for the D.L.O. Appointment for 6 months. Salary £250 p.a., full residential emoluments, with an option of further 6 months at £300 p.a.

Applications, stating age, qualifications with dates, copies of testimonials, nationality, and present post, to—

JOHN W. STRICKLAND, F.H.A., Secretary.

KENT AND CANTERBURY HOSPITAL, Canterbury. Senior HOUSE SURGEON. Applicants should have held house appointments and had surgical experience, particularly in traumatic and orthopædic surgery. Salary at rate of £320 p.a., board, residence, and laundry. The appointment vacant 1st February, 1948.

Applications, stating age, qualifications with dates, experience, details of previous appointments, and accompanied by 3 recent testimonials (copies), should be sent to—

J. F. KENT, Superintendent and Secretary.

THE ROYAL WEST SUSSEX HOSPITAL, Chichester. House SURGEON (A). Salary £150 p.a., full residential emoluments. Now vacant for 6 months.

Applications, with testimonials, to the Secretary.

THE LADY CHICHESTER HOSPITAL, Aldrington House, New Church-road, HOVE. RESIDENT MEDICAL OFFICER. Appointment for 6 months, from 1st January, 1948. Salary £250 p.a.

Applications, with copies of testimonials, immediately to—

November, 1947. PERCY F. SPOONER, Secretary.

DERBYSHIRE COUNTY COUNCIL. Walton Sanatorium, near CHESTERFIELD. RESIDENT ASSISTANT MEDICAL OFFICER (B1), Male or Female. Applicants should have held house appointments and preference given to candidates having previous experience of tuberculosis, including artificial pneumothorax work. Married quarters are not provided. Salary £455 p.a., annual increments £25 to £555 p.a., plus cost-of-living bonus, board, lodging, &c.

Forms of application obtainable from undersigned, and should be returned by 13th December, 1947.

J. B. S. MORGAN, County Medical Officer.

County Offices, Derby, 22nd November, 1947.

LANARK DISTRICT ASYLUM, Hartwood, Shotts, Lanarkshire. JUNIOR RESIDENT MEDICAL OFFICER (B1). Salary £490–£550, residential emoluments valued at £90 p.a. (no married quarters).

Applications, stating age, whether married or single, giving full details of medical qualifications, appointments held, present position, &c., to the Medical Superintendent.

EAST SUFFOLK AND IPSWICH HOSPITAL. (389 Beds.)
REGISTRAR (B1) to Fracture and Orthopædic Dept., vacant now. Salary £500 p.a. Applicants should have good qualifications and experience.
HOUSE PHYSICIAN (B2), vacant now.
HOUSE SURGEON (B2), to the Senior Surgeon, vacant 17th December.
HOUSE SURGEON (B2) to Fracture and Orthopædic Dept., vacant 17th December.
HOUSE SURGEON (A) to a General Surgeon, vacant now.
Salary for last 4 posts £250 p.a. All with full residential emoluments and for 6 months.
Applications to: ARTHUR GRIFFITHS, Secretary.
The Hospital, Ipswich.

COUNTY BOROUGH OF IPSWICH. Deputy Medical Officer OF HEALTH AND SCHOOL MEDICAL OFFICER. Applicants must hold D.P.H. The appointment is whole time under directions of M.O.H.; is subject to Local Government Act, 1937, and passing medical examination. Salary scale £900 p.a., annual increments £50 to £1000, plus cost-of-living bonus and £65 car allowance.
Applications, stating age, experience, qualifications, and any relevant details, with not more than 3 testimonials (copies), by 20th December, 1947. Canvassing disqualifies; relationship to any member or senior officer of Council must be disclosed.
J. G. BARR, Town Clerk.
Town Hall, Ipswich, 19th November, 1947.

NORFOLK AND NORWICH HOSPITAL, Norwich. Casualty OFFICER (B2). Salary £250 p.a., full residential emoluments. To R practitioners appointment limited to 6 months.
Applications as soon as possible to—
F. L. GATFIELD, House Governor and Secretary.

JENNY LIND HOSPITAL FOR CHILDREN, Norwich.
RESIDENT MEDICAL OFFICER (B2), vacant 1st February, 1948. Salary £275 p.a., full residential emoluments.
ASSISTANT RESIDENT MEDICAL OFFICER (A), vacant 15th January, 1948. Salary £250 p.a., full residential emoluments.
Appointments open to Male or Female practitioners and limited to 6 months to R practitioners.
Applications as soon as possible to—
F. L. GATEFIELD, Secretary.

CAMBRIDGESHIRE MENTAL HOSPITAL, Fulbourn, Cambs. ASSISTANT MEDICAL OFFICER (B1) (Male or Female). Salary £455–£555, full residential emoluments. Additional £50 for D.P.M. Emoluments adjusted in case of married man as small self-contained flat is available. Established and pensionable subject to medical examination.
Applications, with 2 references, to Medical Superintendent before 15th December, 1947.

ADDENBROOKE'S HOSPITAL, Cambridge. House Surgeon (A), vacant 16th January, 1948. HOUSE PHYSICIAN (A), vacant 13th January, 1948. Salary £130 p.a., full residential emoluments. Appointments open to Male or Female practitioners. To R practitioners appointment for 6 months only, which is the normal period of appointment.
Applications, stating age, qualifications with dates, and nationality, with copies of 3 recent testimonials, by 10th December, 1947, to: J. A. BEARDSALL, Secretary-Superintendent.

THE TOWERS MENTAL HOSPITAL, Humberstone, Leicester. 2 HOUSE PHYSICIANS (A). Salary £350 p.a., with board, lodging, and washing, valued at £150 p.a. To R practitioners appointments limited to 6 months; otherwise may be renewed for another 6 months. Facilities available for learning methods of psychiatric treatment within the Hospital and in the Outpatient Clinics.
Applications to Medical Superintendent.

CITY GENERAL HOSPITAL, Leicester. Assistant Pathologist in charge of the laboratory. Post is in the Emergency Medical Service under the Ministry of Health and on salary range of £750–£1000 p.a., payable by the Ministry. This salary is assessed on a non-resident basis and will be at rate of £100 p.a. less if full board and lodging provided at expense of Hospital. Appointment terminable by a month's notice on either side.
Applications, stating age, qualifications with dates, present appointment, if any, previous experience, and 3 recent testimonials, should be addressed to Medical Superintendent, City General Hospital, Leicester, not later than 20th December, 1947.

CITY OF LEICESTER. City General Hospital. (550 Beds.) Whole-time appointment of CHIEF ASSISTANT (Male) to Orthopædic Dept. (72 Beds). Candidates should possess higher qualification in surgery and have extensive experience in orthopædic surgery. Post is non-resident and covered by circular 202/46 for ex-Service specialists. The duties entail attendance at Hospital for inpatients and at other orthopædic clinics. Salary £1000 p.a.
Applications, accompanied by 3 recent testimonials, should be sent to Dr. E. K. Macdonald, M.O.H., Grey Friars, Leicester, from whom further details of the appointment can be obtained.
November, 1947. L. MCEVOY, Town Clerk.

THE STAMFORD, RUTLAND, AND GENERAL INFIRMARY. HOUSE SURGEON (A), Male or Female, now vacant. Salary £200 p.a., full residential emoluments. To R practitioners appointment for 6 months.
Applications, stating age, qualifications with dates, nationality, copies of 3 recent testimonials, immediately to Secretary, H. F. DONALD, The Infirmary, Stamford.

MINISTRY OF PENSIONS. Ronkswood Hospital, Worcester. SURGICAL OFFICER (B1), Male. Applicants must have held house appointments and had surgical experience. Salary £350–£550 p.a., according to experience, plus appropriate consolidation addition, free board and lodging, or allowance of £100 p.a. if permission given to live out.
Applications, stating age, qualifications with dates, and nationality, accompanied by 2 recent testimonials (copies), should be addressed to the Secretary, Ministry of Pensions, Medical Services Division, Norcross, Blackpool, Lancs.

COUNTY BOROUGH OF STOCKPORT. Public Health and Assistance Committee require:—
Full-time
(1) RESIDENT MEDICAL OFFICER AND ASSISTANT MEDICAL SUPERINTENDENT for Stepping Hill Hospital and Shaw Heath Institution. Salary £550 p.a. (including £50 for extra duties performed at Shaw Heath Institution and Children's Homes), rising by £25 annual increments to £750 p.a., plus cost-of-living bonus, and emoluments valued at £150 p.a., and £50 car allowance.
(2) RESIDENT OBSTETRICIAN for Stepping Hill Hospital. Preference given to candidates possessing special experience and qualifications in midwifery. Salary £530 p.a., rising by £25 annual increments to £730 p.a., plus cost-of-living bonus, and emoluments valued at £120 p.a.
(3) RESIDENT ASSISTANT MEDICAL OFFICER for Stepping Hill Hospital. Salary £455 p.a., rising by £25 annual increments to £555 p.a., plus cost-of-living bonus, and emoluments valued at £120 p.a.
(4) MEDICAL OFFICER for Shaw Heath Institution and Children's Homes (non-resident). Salary £575 p.a., rising by £25 annual increments to £675 p.a., plus cost-of-living bonus.
Appointments will be subject to determination by 3 months' notice on either side. Candidates appointed required to pass medical examination, and subject to the provisions of Local Government Superannuation Act, 1937.
Visiting Consultant Appointments
(1) ASSISTANT VISITING CONSULTANT PHYSICIAN. 1 session per week at Stepping Hill Hospital and 1 session at Shaw Heath Institution. Fee £4 4s. per session of 1½–2½ hours, plus mileage allowance.
(2) ASSISTANT VISITING CONSULTANT SURGEON for Stepping Hill Hospital. 1 session per week. Fee £4 4s. per session of 1½–2½ hours, plus mileage allowance.
(3) PÆDIATRICIAN for Stepping Hill Hospital. 1 session per week. Fee £4 4s. per session of 1½–2½ hours, plus mileage allowance.
Applications, stating age, qualifications, and experience, together with 3 recent testimonials (copies), should be sent to M.O.H., Town Hall, Stockport, not later than 6th December, 1947.
18th November, 1947.

HERTFORDSHIRE COUNTY COUNCIL. Haymeads Hospital, BISHOP'S STORTFORD, HERTS. HOUSE SURGEON (A), now vacant. Salary £150 p.a., full residential emoluments. Appointment for 6 months.
Applications, with names and addresses of referees, to Medical Superintendent of Hospital.

HERTFORDSHIRE COUNTY COUNCIL. Haymeads Hospital, BISHOP'S STORTFORD, HERTS. HOUSE SURGEON (B2), now vacant. Salary £240 p.a., full residential emoluments. Appointment for 6 months in the first place. General surgery and fractures.
Applications, with copies of testimonials, to Medical Superintendent of Hospital.

WELLHOUSE HOSPITAL, Barnet, Herts. Assistant Pathologist in the laboratory at the above Hospital. The post is in the Emergency Medical Service under the Ministry of Health and on salary range of £750–£1000 p.a., payable by the Ministry. This salary is assessed on a non-resident basis and will be at rate of £100 p.a. less if full board and lodging provided at expense of Hospital. Appointment terminable by a month's notice on either side.
Applications, stating age, qualifications with dates, present appointment, if any, previous experience, and 3 recent testimonials, should be addressed to Medical Superintendent, Wellhouse Hospital, Barnet, not later than 20th December, 1947.

ROYAL CORNWALL INFIRMARY, Truro. House Surgeon (B2) to Gynæcological Dept., vacant now. Salary £200 p.a., full residential emoluments.
Applications, with testimonials, to Secretary-Superintendent.

TONE VALE HOSPITAL, near Taunton, Somerset. Assistant MEDICAL OFFICER at above Mental Hospital. Salary £455–£25–£555, plus £65 p.a. for war accommodation patients, and war bonus £59 19s., with emoluments consisting of board, lodging, and laundry, valued for superannuation purposes at £146 p.a. All forms of therapy are employed at the Hospital and opportunities exist to gain experience in the various types of physical treatment. Facilities afforded for studying for D.P.M.
Applications, with 2 testimonials or names of referees, to Medical Superintendent immediately.

THE CHESTER ROYAL INFIRMARY. (225 Beds.) Resident ANÆSTHETIST (B1), vacant 1st January, 1948. 6 months' appointment. Salary £200 p.a., full residential emoluments.
Applications to be sent to—
P. R. J. ARNOLD, General Superintendent and Secretary.

BOOTLE GENERAL HOSPITAL, Liverpool, 20. Casualty Officer (A) and 2 HOUSE SURGEONS (A). Appointments, open to Male or Female practitioners, for the period ending 30th June, 1948. Salary £200 p.a., full residential emoluments.
Applications, with copies of recent testimonials, as soon as possible to the Superintendent.

COUNTY BOROUGH OF SOUTHEND-ON-SEA. Southend MUNICIPAL HOSPITAL, ROCHFORD, ESSEX. RESIDENT ASSISTANT MEDICAL OFFICER (B2), Male or Female. Duties principally in Medical Division of Hospital. Salary £422 10s. p.a., full residential emoluments valued at £100 p.a., plus cost-of-living bonus. To R practitioners appointment limited to 6 months, otherwise 1 year. Appointee liable to pay superannuation contributions under Local Government Superannuation Act. Applications from serving members of H.M. Forces should state anticipated date available.
Application forms, and particulars of appointment, obtainable from Medical Superintendent, Southend Municipal Hospital, Rochford, Essex, returnable by 15th December, 1947. Canvassing will disqualify. ARCHIBALD GLEN, Town Clerk.

UNIVERSITY OF BRISTOL, in conjunction with the Bristol Royal Hospital, invites applications for the non-resident post of MEDICAL REGISTRAR. Appointment for 1 year and renewable. Salary on scale £500–£750 p.a., according to qualifications and experience. There is a university scheme for children's allowances.

Applications, giving full names, age, qualifications, details of education and experience, with names of 1–3 referees and copies of 1–3 recent testimonials, should reach undersigned, from whom further particulars obtainable, by 31st December, 1947.

WINIFRED SHAPLAND, Secretary and Registrar,
University of Bristol, Bristol, 8.

COUNTY BOROUGH OF READING. Public Health Department. MEDICAL DIRECTOR of Mass Radiography Unit for Reading and surrounding district. Previous clinical experience in diagnosis and treatment of diseases of the chest essential. Experience in radiology and possession of a radiological qualification an advantage. Commencing salary £900, biennial increments £50 to £1087 p.a., with cost-of-living bonus. Appointee required to act under direction of M.O.H. Appointment subject to Local Government Superannuation Act, 1937, and successful candidate required to pass medical examination. Appointment also subject to determination by 3 months' notice, in writing, on either side.

Applications, form obtainable from M.O.H., with copies of 3 recent testimonials, endorsed "Medical Director," should be sent direct to M.O.H., P.H. Dept., Town Hall, Reading. Canvassing, in any form, a disqualification.

G. F. DARLOW, Town Clerk.

Town Hall, Reading, 29th November, 1947.

ROYAL BERKSHIRE HOSPITAL, Reading. Casualty Officer (A), Male, vacant immediately. Salary £150 p.a., full residential emoluments. To R practitioners appointment for 6 months.

Applications, stating age, qualifications with dates, nationality, and present post, with copies of 3 recent testimonials, immediately to House Governor.

ROYAL BERKSHIRE HOSPITAL, Reading. Resident Medical OFFICER (A) (Male) (Blagrave Branch Hospital) and Assistant to the Pathologist, vacant 7th January, 1948. Salary £150 p.a., full residential emoluments. To R practitioners appointment for 6 months.

Applications, stating age, qualifications with dates, nationality, and present post, with copies of 3 recent testimonials, immediately to: H. E. RYAN, House Governor.

MAIDENHEAD HOSPITAL, Berkshire. (100 Beds.) Resident MEDICAL OFFICER (B2), Male, vacant 15th December, 1947. Salary £250 p.a., full residential emoluments. To R practitioners appointment for 6 months; otherwise 1 year.

Applications, stating age, experience, qualifications, and nationality, with copies of testimonials, to Superintendent-Secretary by 8th December, 1947.

CANADIAN RED CROSS MEMORIAL HOSPITAL, Taplow, MAIDENHEAD, BERKS. Applications invited from licentiates in dental surgery of one of the Royal Colleges of Surgeons for posts of VISITING DENTAL SURGEONS at this new Hospital. Experience in faciomaxillary work necessary for one appointment. Hospital will ultimately have a bed complement of approximately 450, half of which number to be devoted to research into and treatment of juvenile rheumatism, and remainder for acute sick and maternity cases. Remuneration on sessional basis of 4 guineas for 1½–2½ hours, for an initial period. When the nature and amount of work undertaken in each department is known a salary payment as in the case of other staff may be adopted. In addition an allowance will be paid for travelling and/or travelling time. Appointments to be made in consultation with Joint Advisory Board for Hospitals in South Bucks and East Berks area.

Applications by letter, stating age, qualifications, experience, present appointments, with copies of 3 recent testimonials, by 31st December, 1947, to: JOHN R. GRIFFITH, House Governor.

CANADIAN RED CROSS MEMORIAL HOSPITAL, Taplow, MAIDENHEAD, BERKS. HOUSE SURGEON (A). Salary £150 p.a., residential emoluments. Appointment for 6 months, to commence 1st January, 1948. Successful candidate may be called upon to give anæsthetics for emergency operations.

Applications immediately to—

JOHN R. GRIFFITH, House Governor.

WEST BROMWICH AND DISTRICT GENERAL HOSPITAL INC. (134 Beds.) RESIDENT ANÆSTHETIST AND HOUSE SURGEON (B2). Candidates should have good experience in anæsthetics. Annual appointment. Salary £400–£50–£500 p.a., full residential emoluments. To R practitioners appointment limited to 6 months.

Applications, stating age, qualifications with dates, and nationality, with 3 recent testimonials, immediately to—

JOHN O. ROBINS, House Governor and Secretary.

ROYAL BUCKINGHAMSHIRE HOSPITAL.

HONORARY SURGEON to E.N.T. Dept. Candidates must be Fellows of one of the Royal Colleges of Surgeons of Great Britain and should have had considerable experience in the work of the specialty.

HONORARY DENTAL SURGEON to the Hospital. Candidates must have had considerable experience in dental surgery.

Applications, with names of 3 referees, should be submitted to undersigned (from whom further particulars of appointments can be obtained) by 31st December, 1947.

K. H. ROBBINS, Secretary-Superintendent.

VICTORIA CENTRAL HOSPITAL, Wallasey. (13½ Beds.)

2 HOUSE SURGEONS (A), vacant immediately. Appointments for 6 months. Salary £200 p.a., full residential emoluments.

RESIDENT SURGICAL OFFICER for 6 months, commencing 1st January, 1948. Salary £350 p.a., full residential emoluments.

Applications, stating age, nationality, qualifications, and experience, with names of 2 referees, as early as possible to—

J. B. DANIELS, Acting Secretary-Superintendent.

ROYAL SOUTH HANTS AND SOUTHAMPTON HOSPITAL, SOUTHAMPTON. (291 Beds.)

HOUSE PHYSICIAN (B2), Male. Appointment for 6 months. Salary £175 p.a., full residential emoluments.

2 RESIDENT ANÆSTHETISTS (B2), Male. Appointments recognised for D.A. Salary £200 p.a., full residential emoluments. To R practitioners appointment limited to 6 months.

Applications, stating age, qualifications with dates, nationality, and present post, with copies of 3 recent testimonials, immediately to: FRANK JENNINGS, House Governor and Secretary.

14th November, 1947.

SOUTHAMPTON CHILDREN'S HOSPITAL. (63 Beds.) Second RESIDENT MEDICAL OFFICER (B2), vacant early January. Salary at rate of £150 p.a., full residential emoluments. Special preference will be given to those intending to specialise in pædiatrics. The Hospital is recognised by the Conjoint Board for D.C.H. To R practitioners appointment limited to 6 months.

Applications, stating age, qualifications with dates, and nationality, accompanied by 3 testimonials, not later than 10th December to: ELLA K. MATTHEWS, Secretary.

FREE EYE HOSPITAL, Southampton. House Surgeon (A), Male or Female, vacant 1st January, 1948. Salary £250 p.a., full residential emoluments. Applicants with ophthalmic experience preferred. To R practitioners appointment for 6 months; otherwise 6 months renewable by Committee of Management.

SOUTHEND-ON-SEA GENERAL HOSPITAL. Orthopædic, REGISTRAR AND SENIOR CASUALTY OFFICER (Male), vacant immediately. Salary at rate of £350 p.a., full residential emoluments. 6 months' appointment.

Applications, stating age, nationality, qualifications, and experience, together with copies of 3 recent testimonials, should be sent immediately to—

JOHN WILLIAMS, House Governor and Secretary.

LORD MAYOR TRELOAR CRIPPLES' HOSPITAL, Alton, Hants, and HAYLING ISLAND. (400 Beds.) RESIDENT MEDICAL OFFICER (B1), Male, now vacant. Post provides useful experience in orthopædics, plastic surgery, and surgical tuberculosis. Tenable for 1 year. Salary £350 to £550 p.a., according to experience, full board residence.

Applications as soon as possible to Secretary, with copies of testimonials or names of 2 persons as referees.

THE ROYAL HOSPITAL, Wolverhampton. (Incorporated under Royal Charter.) (310 Beds.) CASUALTY OFFICER (B2), Male, vacant now. Salary £250 p.a., full residential emoluments. To R practitioners appointment limited to 6 months.

Applications to: W. COCKBURN, House Governor.

THE ROYAL HOSPITAL, Wolverhampton. (Incorporated under Royal Charter.) ASSISTANT RESIDENT MEDICAL OFFICER (B2), Female, for Gynæcological and Obstetric Dept. (63 Beds), vacant 7th January, 1948. Salary £150 p.a., full residential emoluments.

Applications to: W. COCKBURN, House Governor.

WOLVERHAMPTON AND MIDLAND COUNTIES EYE INFIRMARY. HOUSE SURGEON (B2), Male or Female. Appointment for 6 months from 1st January, 1948. Salary £200 p.a., full residential emoluments. The Infirmary, which has 95 Beds and a large Outpatient Dept., is recognised as a Hospital at which the full course of instruction for admission to the D.O.M.S. may be taken.

Applications as soon as possible to—

T. W. LYMER, Secretary-Superintendent.

LINCOLN COUNTY HOSPITAL. (Voluntary Hospital—200 Beds.) HOUSE SURGEON (A), Male or Female, vacant now. Salary £225 p.a., full residential emoluments. To R practitioners appointment for 6 months.

Applications, stating age, qualifications with dates, nationality, with copies of 3 recent testimonials, to—

RONALD W. HOWICK, Secretary-Superintendent.

CITY AND COUNTY OF THE CITY OF LINCOLN. Assistant MEDICAL OFFICER OF HEALTH required to act as Medical Officer to City Hospital and Sanatorium for the treatment of infectious diseases and tuberculosis, and to carry out other duties in connexion with health services. Salary scale £650–£25–£850 p.a. Suitable residential accommodation available at Hospital.

Forms of application and conditions of appointment obtainable from M.O.H., City Health Dept., Beaumont Fee, Lincoln, to whom they should be returned by 15th December, 1947.

J. H. SMITH, Town Clerk.

Corporation Offices, Lincoln, 17th November, 1947.

INGHAM INFIRMARY, South Shields. (180 Beds and 6 Resident Medical Staff.) RESIDENT ANÆSTHETIST (B2). Infirmary recognised for D.A. Salary £250 p.a., full residential emoluments.

Applications, with copies of 3 testimonials, to—

R. HOOD COULTHARD, jun., House Governor and Secretary.

COUNTY BOROUGH OF SOUTH SHIELDS. General Hospital. (176 Beds.) (*a*) HOUSE SURGEON (A), and (*b*) HOUSE PHYSICIAN (A) at above Hospital.

Salary at rate of £180 p.a. for the first 6 months, and, if re-engaged, £230 p.a. for the second 6 months. In addition medical quarters are provided, emoluments being valued at £120 p.a., and cash cost-of-living bonus is divided equally between salary and emoluments.

Applications, together with 3 recent testimonials, to the Medical Superintendent, General Hospital, Harton-lane, South Shields, as early as possible. HAROLD AYREY, Town Clerk.

MACCLESFIELD GENERAL INFIRMARY. Junior House Surgeon (A). Salary £250 p.a., full residential emoluments. To R practitioners appointment limited to 6 months.

Apply to Secretary-Superintendent.

THE KIDDERMINSTER AND DISTRICT GENERAL HOSPITAL. CASUALTY HOUSE SURGEON (A). Post vacant immediately to Male or Female. Salary £200 p.a., full residential emoluments. Limited to 6 months to R practitioners.

Applications should be sent immediately to—

C. M. SMITH, House Governor and Secretary.

HEREFORDSHIRE GENERAL HOSPITAL, Hereford. (154 Beds.) JUNIOR HOUSE SURGEON (A), Male, including House Surgeon to the E.N.T. Dept., vacant immediately. Limited to 6 months. Salary £150 p.a., full residential emoluments.

Applications to: T. W. UPTON, Secretary.

BURTON-ON-TRENT GENERAL INFIRMARY. (230 Beds.) RESIDENT HOUSE SURGEON (temporary post, for 6 weeks from 29th November, 1947, to 10th January, 1948). Salary according to qualifications and experience, plus residential emoluments.

Applications, stating age, qualifications, and previous experience, to: J. E. SMITH, Superintendent and Secretary.

ROYAL LANCASTER INFIRMARY, Lancaster. (226 Beds.) ORTHOPÆDIC AND CASUALTY HOUSE SURGEON (B2), vacant 6th December, 1947. Salary £210 p.a., full residential emoluments. Limited to 6 months to R practitioners.

Applications to: F. A. MILNES, Superintendent-Secretary.

COUNTY BOROUGH OF BLACKBURN. Public Assistance DEPARTMENT. RESIDENT ASSISTANT MEDICAL OFFICER (B1) at Queen's Park Hospital and Institution, Blackburn. Salary £455 p.a. (plus cost-of-living bonus), increasing by annual increments £25 to £555, residential emoluments. Surgical, medical, and obstetrical units at the Hospital each under clinical direction of medical practitioners of consultant status. Successful candidate will, in first instance, be in surgical unit but he will be called upon for duties in other units of the Hospital.

Further particulars obtainable from Public Assistance Officer, Cardwell-place, Blackburn, and applications to be sent to him, stating age, qualifications, experience, with copies of 2 recent testimonials.

14th November, 1947. CHAS. S. ROBINSON, Town Clerk.

OLDHAM ROYAL INFIRMARY. (203 Beds.) House Surgeon (A), Male or Female. Appointee will act as House Surgeon to the Ophthalmic Surgeon and Orthopædic Dept., and assist in Casualty Dept. Salary £200 p.a., full residential emoluments. To R practitioners appointment for 6 months.

Applications, with copies of 3 testimonials, immediately to—
F. W. BARNETT, House Governor and Secretary.

ALTRINCHAM GENERAL HOSPITAL, near Manchester. (100 Beds—3 Residents.) HOUSE PHYSICIAN AND CASUALTY OFFICER (A), Male or Female. Salary £150 p.a., usual emoluments. To R practitioners limited to 6 months; otherwise renewal for a further period.

Applications to General Superintendent as soon as possible.

ANCOATS HOSPITAL, Manchester, 4. Resident Casualty Officer (B1), to commence duty 1st January, 1948. One who has passed the primary examination of the Royal College of Surgeons, England, or its equivalent, preferred. Must have held resident house appointment. Salary £225 p.a., full residential emoluments.

Applications, giving age, qualifications, and previous experience, with copies of 3 recent testimonials, by 3rd December, to—
HERBERT J. DAFFORNE,
General Superintendent and Secretary.

MANCHESTER HOSPITAL FOR CONSUMPTION AND DIS-EASES OF THE THROAT AND CHEST. RESIDENT SURGICAL OFFICER (B2) at St. Anne's Hospital, Bowdon, Cheshire. The Hospital has 50 Beds for E.N.T. cases. Salary £250 p.a., full residential emoluments.

Applications, stating age, qualifications, and nationality, and accompanied by 3 recent testimonials (copies), by 13th December to: W. HUNT, Secretary, 45, Hardman-street, Manchester, 3.

MANCHESTER ROYAL INFIRMARY. Senior House Surgeon (B2) to Professorial Unit, vacant 8th January, 1948. Six months' appointment at a salary of £150 p.a., with residence, subject to by-laws as to notice, &c.

Applications, stating age, nationality, qualifications, with copies of testimonials, to be sent to the Chairman of the Medical Board by 13th December, 1947. By order,
F. J. CABLE, General Superintendent and Secretary.

17th November, 1947.

AMENDED ADVERTISEMENT

MANCHESTER CORPORATION. Withington Hospital. (Adult, General—1150 Beds.) (*a*) RESIDENT JUNIOR ANÆSTHETIST (B2), (*b*) HOUSE OFFICERS (Midwifery and Gynæcology) (B2). Salary in each case £250 p.a.

(*c*) HOUSE OFFICERS (A) to Surgical Dept., (*d*) HOUSE OFFICERS (A) to Medical Dept. Salary in each case £200 p.a.

All appointments subject to Manchester Corporation conditions of service. Temporary bonus, and board, residence, and laundry valued at £120 p.a., provided in each instance. To R practitioners appointments for 6 months; otherwise 6 months renewable for further 6 months but not renewable thereafter. Members of H.M. Forces may apply.

Applications, stating full name, date of birth, nationality, qualifications with dates, particulars of present appointment and past hospital appointments, to Medical Superintendent, Withington Hospital, West Didsbury, Manchester, 20, by 10th December, 1947. Canvassing in any form prohibited.
PHILIP B. DINGLE, Town Clerk.

Town Hall, Manchester, 2, 15th November, 1947.

MANCHESTER CORPORATION. Withington Hospital. (Adult, General—1150 Beds.) RESIDENT ASSISTANT OBSTETRICAL OFFICER (B1), Male or Female. Appointment limited to maximum 1 year's duration. Candidates must have midwifery experience. Preference given to candidate who has higher qualification in midwifery. Basic salary £350 p.a., plus temporary bonus and board, residence, and laundry in addition valued at £120 p.a., subject to Manchester Corporation conditions of service. Members of H.M. Forces, may apply

Full information and forms of application obtainable from M.O.H., Hospitals Administration Section, P.O. Box 399, Town Hall, Manchester, 2, and returnable to him by 10th December, 1947. Canvassing in any form prohibited.
PHILIP B. DINGLE, Town Clerk.

Town Hall, Manchester, 2, 10th November, 1947.

MANCHESTER CORPORATION. Health Department. Non-RESIDENT MEDICAL SUPERINTENDENT at the Crumpsall Hospital (Adult, General—1400 Beds), and MEDICAL OFFICER of Park House (an adjoining poor-law institution of 1644 Beds—including 670 Beds for mental patients), Crumpsall, Manchester, 8. The Hospital is a recognised training school for nurses. Candidates must be experienced physicians with hospital and institution administrative experience. Salary, inclusive of emoluments in respect of all services required in connexion with the Hospital and Park House, at rate of £1450 a year, rising by biennial increments of £100 to maximum of £1650, subject to the Manchester Corporation conditions of service. A temporary bonus payable in addition to basic salary.

Full information and application forms obtainable from the Town Clerk, Town Hall, Manchester, 2, and returnable to him by 19th December, 1947. Canvassing in any form is prohibited.
PHILIP B. DINGLE, Town Clerk.

Town Hall, Manchester, 2, 18th November, 1947.

MANCHESTER CORPORATION. Crumpsall Hospital. (1400 Beds.) PHYSICIAN in charge of Physiotherapy Dept. at Crumpsall Hospital, Crumpsall, Manchester, 8. Part-time appointment with no right of entry into Corporation superannuation fund. Candidates should have previous experience in physical medicine and, preferably, hold higher diploma in that subject. Remuneration on sessional fee basis at rate of £4 4s. per session, normally 1¼–2½ hours' duration, plus mileage allowance as necessary, in accordance with Manchester Corporation conditions of service. 2 sessions weekly will be required.

Forms of application and copies of memorandum on terms and conditions of appointment may be obtained from the M.O.H., Health Dept., Hospitals Administration Section, P.O. Box 399, Town Hall, Manchester, 2. Applications to be addressed to Town Clerk, Town Hall, Manchester, 2, not to any member of the Council, and received by 12th December, 1947. Canvassing in any form prohibited. PHILIP B. DINGLE, Town Clerk.

Town Hall, Manchester, 2, 18th November, 1947.

MANCHESTER CORPORATION. Crumpsall Hospital. (Adult, General—1400 Beds.) RESIDENT SURGICAL OFFICER (B1). Applicants must hold higher qualification in surgery and have had previous experience in resident hospital posts. Salary scale £475 p.a., rising to maximum of £650, actual commencing salary fixed within scale according to successful candidate's experience. Board, residence, and laundry provided, valued for superannuation purposes at £150 p.a. Temporary bonus payable in addition to the basic salary. Subject to the Manchester Corporation conditions of service. The appointment tenable for 2 years but renewable annually at discretion of Health Committee to maximum of 5 years' duration.

Full information and forms of application obtainable from Town Clerk, Town Hall, Manchester, 2, by whom applications must be received not later than 13th December, 1947. Canvassing in any form prohibited.

PHILIP B. DINGLE, Town Clerk.

Town Hall, Manchester, 2, 15th November, 1947.

MANCHESTER ROYAL INFIRMARY. Board of Management invite applications from Male and Female practitioners for following A appointments:—

3 HOUSE PHYSICIANS (2 for 15th and 1 for 22nd January, 1948).

7 HOUSE SURGEONS (4 for 15th and 3 for 22nd January, 1948).

2 HOUSE SURGEONS for the Aural, Gynæcological, and Dermatological Depts. (1 for 15th and 1 for 22nd January, 1948).

1 HOUSE SURGEON for the Neurosurgical Dept. (for 15th January, 1948).

2 HOUSE SURGEONS for the Orthopædic Dept. (1 for 15th and 1 for 22nd January, 1948).

If applying for more than one of the above posts, candidates should state the order of their preference. 6 months' appointments, subject to provisions of the by-laws as to notice, &c. Salaries £75 p.a., usual residential emoluments.

Applications, stating nationality, age, and qualifications, to the Chairman of the Medical Board by 17th December, 1947.
By order,
F. J. CABLE, General Superintendent and Secretary.

17th November, 1947.

CHRISTIE HOSPITAL AND HOLT RADIUM INSTITUTE, MANCHESTER, 20. VISITING PLASTIC SURGEON. Applicants must hold a higher surgical qualification. Appointee required to work at the Hospital 2 afternoon sessions per week. Salary according to B.M.A. scale.

Applications, with names of 3 referees, by 20th December to—
A. H. KEATES, Superintendent.

CHRISTIE HOSPITAL AND HOLT RADIUM INSTITUTE, MANCHESTER, 20. CHIEF ASSISTANT to the Urological Surgeon. Applicants must hold a higher surgical qualification. Appointee required to work at the Hospital each Wednesday morning. Salary £150 p.a. Appointment on an annual basis but the holder is eligible for reappointment up to a maximum of 3 years.

Applications, with names of 3 referees, by 20th December to—
A. H. KEATES, Superintendent.

MANCHESTER VICTORIA MEMORIAL JEWISH HOSPITAL, CHEETHAM, MANCHESTER, 8. (Non-sectarian—102 Beds). HONORARY PHYSICIAN on Staff of above Hospital. Applicants must be recognised consultants and hold the diploma of either F.R.C.P. or M.R.C.P. (Lond.)

Applications, together with 3 or more copies of recent testimonials, to undersigned by 13th December.

By order of the Board of Management,
CHARLES D. DRAKE, General Superintendent.

MANCHESTER VICTORIA MEMORIAL JEWISH HOSPITAL, CHEETHAM, MANCHESTER, 8. (Non-Sectarian—102 Beds.) CASUALTY OFFICER AND HOUSE SURGEON (A). Salary £175 p.a., full residential emoluments. Appointment for 6 months.

Applications to: C. D. DRAKE General Superintendent.

COUNTY BOROUGH OF ST. HELENS. Psychiatrist to St. Helens Child Guidance Clinic (3 to 4 sessions per week). Applicants should have postgraduate qualification in psychology and experience in child psychiatry, preferably at a child guidance clinic. Payment will be at the rate of £4 4s. per session, plus mileage allowance. Successful candidate may later be appointed Consultant Adviser to the Local Health Authority in connexion with their Mental Health Services.

Applications (no special forms), accompanied by 2 recent testimonials (copies), or giving 2 references, by 15th December, 1947, to: FRANK HAUXWELL, Medical Officer of Health.

Town Hall, St. Helens, Lancs.

ROYAL ALBERT EDWARD INFIRMARY AND DISPENSARY, WIGAN. HOUSE SURGEON (A), vacant 12th January, 1948. Salary £150 p.a., full residential emoluments. To R practitioners appointment for period of 6 months; otherwise may be extended for a further period.

Applications, stating age, qualifications with dates, and nationality, and accompanied by 3 recent testimonials (copies), should be sent as soon as possible to—

A. STANLEY BRUNT, General Superintendent and Secretary.

LANCASHIRE COUNTY COUNCIL. Public Health Committee. PARK HOSPITAL, DAVYHULME, near MANCHESTER. ASSISTANT PATHOLOGIST, Male or Female, whole time, non-resident. Appointee required to have experience and interest in morbid anatomy and histology. Salary £900 p.a., cost-of-living bonus. Appointment subject to medical examination and superannuable.

Applications to County Medical Officer of Health, Hospital and Medical Department, County Offices, Preston, by 8th December, 1947. R. H. ADCOCK, Clerk of the County Council.

County Offices, Preston, 14th November, 1947.

LANCASHIRE COUNTY COUNCIL. Public Health Committee. PARK HOSPITAL, DAVYHULME, near MANCHESTER. JUNIOR HOUSE SURGEON (B2), Male or Female. Salary £250 p.a., cost-of-living bonus and full residential emoluments. To R practitioners appointment limited to 6 months; otherwise renewable for further period of 6 months.

Full particulars and application forms obtainable from, and returnable to, County Medical Officer of Health, Hospital and Medical Dept., County Offices, Preston, by 8th December, 1947. R. H. ADCOCK, Clerk of the County Council.

County Offices, Preston, 10th November, 1947.

LANCASHIRE COUNTY COUNCIL. Public Health Committee. COUNTY HOSPITAL, WHISTON, PRESCOT, near LIVERPOOL. JUNIOR HOUSE SURGEON (B2) (E.N.T.). The Hospital is approved for D.L.O. To R practitioners the appointment is limited to 6 months; otherwise successful applicant will be eligible for reappointment for a further 6 months. Salary £250 p.a., plus cost-of-living bonus and full residential emoluments.

Full particulars and application forms obtainable from County Medical Officer of Health, Hospital and Medical Dept., County Offices, Preston, to whom they must be returned not later than Monday, 15th December, 1947.

R. H. ADCOCK, Clerk of the County Council.

County Offices, Preston, 19th November, 1947.

LANCASHIRE COUNTY COUNCIL. County Hospital, Ashton-UNDER-LYNE, near MANCHESTER. JUNIOR RESIDENT MEDICAL OFFICER (B2). The duties will include assisting in the work of the Obstetrical Dept. Salary at rate of £250 p.a., together with cost-of-living bonus and full residential emoluments. The appointment is subject to medical examination and is superannuable. To R practitioners the appointment is limited to 6 months; otherwise may be renewed for a further period of 6 months.

Forms of application may be obtained from the County Medical Officer of Health, Hospital and Medical Dept., County Offices, Preston, to whom applications must be forwarded by Monday, 8th December, 1947.

R. H. ADCOCK, Clerk of the County Council.

County Offices, Preston, 21st November, 1947.

LEIGH INFIRMARY, Lancs. (General Hospital—102 Beds.) HOUSE SURGEON CASUALTY OFFICER (B2), vacant immediately. Salary £250 p.a., full residential emoluments. To R practitioners appointment for 6 months.

Applications, staging full particulars, with copies of 3 recent testimonials, as scon as possible to—

B. R. CARTER, Secretary-Superintendent.

LIVERPOOL REGIONAL HOSPITAL BOARD. Assistant Senior MEDICAL OFFICER. Salary £1450, annual increments £50 to £1650, subject to deduction of 6% for superannuation purposes. Applicants should have previous experience in hospital administration and would be expected to assist the Board's Senior Administrative Medical Officer in the planning, organisation, and the staffing of the hospital and specialist services within the region and to carry out any administrative and executive functions that may be assigned to him. Further particulars supplied on application.

Applications, giving particulars of qualifications and experience, together with names of 3 referees, to Chairman, Liverpool Regional Hospital Board, Room 26, 2nd Floor, 87, Lord-street, Liverpool, 2, by 15th December. Canvassing in any form will disqualify.

LIVERPOOL REGIONAL HOSPITAL BOARD. Regional PSYCHIATRIST at an inclusive salary of £2000 p.a., subject to deduction of 6% for superannuation purposes. Applicants should have wide experience in general psychiatry, including administrative experience of both inpatient and outpatient work. The officer appointed will, subject to the general direction of the Senior Administrative Medical Officer, be responsible for the surveying, planning, and supervision of the mental health services in the region.

Applications, giving particulars of qualifications and experience, together with names of 3 referees, addressed to the Chairman, Liverpool Regional Hospital Board, Room 26, 2nd Floor, 87, Lord-street, Liverpool, 2, to reach him not later than 15th December. Canvassing in any form will disqualify. Further particulars supplied on application.

THE ROYAL LIVERPOOL CHILDREN'S HOSPITAL, Myrtle-street, LIVERPOOL, 7. HONORARY SURGEON AND SURGEON IN CHARGE of the Orthopædic Dept. Candidates must possess a registrable qualification and the Fellowship of the Royal College of Surgeons of England, Edinburgh, or Ireland.

Applications, giving age, qualifications, and experience, together with the names of 3 referees, should be submitted to the Chairman of the Hospital by 6th December, 1947.

ROYAL LIVERPOOL BABIES HOSPITAL, Woolton, Liverpool. Required RESIDENT MEDICAL OFFICER (A), commencing immediately. Salary £200, plus residential emoluments. To R practitioners appointment limited to 6 months.

Apply to Hon. Secretary, 9, Copperas Hill, Liverpool, 3.

LIVERPOOL AND DISTRICT HOSPITAL FOR DISEASES OF THE HEART, 34, Oxford-street, LIVERPOOL, 7. HOUSE PHYSICIAN (A), Male or Female, to commence 1st February. Appointment for 6 months. Salary £100 p.a., full residential emoluments. Facilities for M.D. thesis.

Applications to Secretary.

VICTORIA HOSPITAL FOR SICK CHILDREN, Hull. Resident HOUSE SURGEON (A) (Female), vacant about 18th December, 1947. Salary £200 p.a., board, residence, and laundry.

Applications, with testimonials, to Secretary by 6th December, 1947.

VICTORIA HOSPITAL, Burnley. (183 Beds.) House Surgeon (A) to Special Depts. (Ophthalmic, Aural, and Fracture). Salary £200 p.a., usual residential emoluments. To R practitioners appointment for 6 months.

Applications, with copies of testimonials, to—

J. E. WHEATCROFT, Secretary.

MONTAGU HOSPITAL, Mexborough, Yorks. (122 Beds—Voluntary, with Visiting Consultant Staff.) HOUSE SURGEON (B2) (Male). Commencing salary £200 p.a., full residential emoluments. To R practitioners appointment for 6 months.

Applications to: A. R. C. RENNER, Secretary-Superintendent.

THE GENERAL INFIRMARY AT LEEDS. Resident Ophthalmic OFFICER (B1). Previous experience in ophthalmic surgery essential. Salary £175 p.a.

Applications by 5th December, 1947, to—

S. CLAYTON FRYERS, House Governor and Secretary.

KETTERING AND DISTRICT GENERAL HOSPITAL. Senior HOUSE SURGEON (B2). Salary £300 p.a., full emoluments. Appointment in first instance for 6 months.

Applications, stating age, qualifications, experience, with 1–3 recent testimonials (copies), as soon as possible to—

G. W. JACKSON, Secretary-Superintendent.

HUDDERSFIELD ROYAL INFIRMARY. (321 Beds.) Casualty OFFICER (B2) required to commence immediately. Salary £200 p.a., full residential emoluments. Limited to 6 months to R practitioners.

Applications to be sent to—

H. J. JOHNSON, General Superintendent and Secretary.

DONCASTER ROYAL INFIRMARY. Resident Medical Officer (B1), Male. This large industrial area offers excellent opportunities for gaining experience. Commencing salary £300 p.a., full residential emoluments.

Applications, with copies of 3 testimonials, by 6th December, 1947, to: A. JONES, Secretary-Superintendent.

DONCASTER ROYAL INFIRMARY. (339 Beds.) Casualty Officer (B2), Male. Salary £250 p.a., full residential emoluments. To R practitioners appointment limited to 6 months. This large industrial area offers excellent opportunities for gaining experience.

Applications, stating age, qualifications with dates, nationality, present post, and accompanied by 3 recent testimonials (copies), should be sent immediately to—

A. JONES, Secretary-Superintendent.

CITY AND COUNTY OF NEWCASTLE UPON TYNE. NEWCASTLE GENERAL HOSPITAL. JUNIOR RESIDENT ANÆSTHETIST (B1), Male or Female, vacant 1st February, 1948. Applicants must have previous experience, and required to carry out major portion of emergency anæsthetist work. Appointment for 12 months. Salary £350 p.a., plus cost-of-living bonus and usual residential emoluments.

Applications, stating age, qualifications, and experience, with copies of 3 recent testimonials, immediately to M.O.H.

JOHN ATKINSON, Town Clerk.

Town Hall, Newcastle upon Tyne, 1, 12th November, 1947.

CITY AND COUNTY OF NEWCASTLE UPON TYNE. NEWCASTLE GENERAL HOSPITAL. (900 Beds.) Part-time ASSISTANT SURGEON to Dept. of Urology. Applicants must hold higher qualifications in surgery. Salary £750 p.a.

Applications, giving details of experience, with copies of 2 recent testimonials, to M.O.H., Town Hall, Newcastle upon Tyne, 1, immediately.

8th November, 1947. J. ATKINSON, Town Clerk.

ROYAL VICTORIA INFIRMARY, Newcastle upon Tyne. Depart-MENT OF ANÆSTHESIA. ASSISTANT ANÆSTHETIST (open appointment). Applicants should hold the D.A. of the Royal College of Surgeons and have had considerable experience in clinical anæsthesia. Appointment part time and involves service to the Infirmary of the equivalent of 6 half-day sessions per week. Tenure of appointment 5 years, renewable. Salary £750 p.a.

Applications, stating age, qualifications, and details of experience, with 3 recent testimonials, as soon as possible to—

A. W. SANDERSON, House Governor.

THE CHILDREN'S HOSPITAL, Sheffield (Inc.). (201 Beds.) RESIDENT MEDICAL ASSISTANT (B1) to a Medical Unit, vacant 5th January, 1948. It includes inpatient and outpatient work. Applicants should have had previous experience in pædiatrics. Preference given to candidates holding a higher qualification. Salary £350 p.a., full residential emoluments. Appointment tenable for 1 year.

Applications, with 3 testimonials, to the Superintendent and Secretary by 19th December, 1947.

THE CHILDREN'S HOSPITAL, Sheffield (Inc.). (201 Beds.) PÆDIATRIC SURGEON. Applicants required to devote their entire time to pædiatric surgery and associated teaching and research. Remuneration for full-time appointment £2000 p.a., but consideration might be given to part-time appointment at £1500 p.a., allowing of private practice in pædiatric surgery. Applicants must be Fellows of the Royal College of Surgeons and have experience in the surgery of children.

Applications, with names of 3 referees, to Superintendent and Secretary, The Children's Hospital, Western Bank, Sheffield, 10, by 19th January, 1948.

ROYAL SHEFFIELD INFIRMARY AND HOSPITAL. The Royal HOSPITAL, SHEFFIELD. SURGICAL FIRST ASSISTANT (B1), Male or Female. Preference given to candidates with experience in urological surgery and holding the Fellowship of one of the Royal Colleges of Surgeons. Salary £650 p.a., non-resident. Medical officers recently demobilised from H.M. Forces may apply.

Applications immediately to: JOSEPH GRIFFITH, General Superintendent, Royal Sheffield Infirmary and Hospital, Royal Infirmary, Sheffield.

ROYAL SHEFFIELD INFIRMARY AND HOSPITAL. The Royal HOSPITAL, SHEFFIELD. FIRST ASSISTANT (B1) to Orthopædic Dept. Salary £650 p.a., non-resident. Previous experience in orthopædics desirable and preference given to applicants who are Fellows of one of the Royal Colleges of Surgeons.

Applications to General Superintendent, Royal Infirmary, Sheffield.

ROYAL SHEFFIELD INFIRMARY AND HOSPITAL. The Royal INFIRMARY, SHEFFIELD. HOUSE SURGEON (A) to the Ophthalmic Dept. and HOUSE SURGEON (A) to the Neuro-surgical Dept., posts now vacant to Males or Females. Salary £80 p.a., full residential emoluments, bonus £20 payable at expiration of 6 months' satisfactory service. To R practitioners appointment for 6 months.

Applications forthwith to: JOSEPH GRIFFITH, General Superintendent, The Royal Infirmary, Sheffield, 6.

15th November, 1947.

ROYAL SHEFFIELD INFIRMARY AND HOSPITAL. The Royal HOSPITAL UNIT. 1 E.N.T. HOUSE SURGEON (A), 1 ASSISTANT CASUALTY OFFICER (A), posts now vacant to Male or Female. Salary £80 p.a., full residential emoluments. Bonus £20 payable after 6 months' satisfactory service, further bonus £10 after second 6 months' satisfactory service. To R practitioners appointment for 6 months; otherwise may be extended.

Applications, copy testimonials, immediately to: JOSEPH GRIFFITH, General Superintendent, at The Royal Hospital, Sheffield, 1.

CITY OF BIRMINGHAM. Dudley Road Hospital. (A Municipal General Hospital with 1050 Beds.) JUNIOR MEDICAL OFFICER (A) (Male or Female), Surgical Unit, vacant January next. Salary £250 p.a., residential emoluments. To R practitioners appointment for 6 months; otherwise 1 year.

Applications, stating age, qualifications, nationality, and experience, with copies of 3 recent testimonials, to Medical Superintendent, Dudley Road Hospital, Birmingham, 18, by 20th December, 1947.

CITY OF BIRMINGHAM. Dudley Road Hospital. (Municipal General Hospital with 1050 Beds.) ASSISTANT ANÆSTHETIST (resident), Male or Female. Candidates must have special experience in anæsthesia, and if not in possession of D.A. should be studying for such diploma. Salary £400 p.a., residential emoluments. Appointment limited to 1 year.

Applications, stating age, qualifications, nationality, and experience, with copies of 3 recent testimonials, to Medical Superintendent, Dudley Road Hospital, Birmingham, 18, by 12th December, 1947.

BIRMINGHAM UNITED HOSPITAL. The General Hospital. THE QUEEN ELIZABETH HOSPITAL. (Also incorporating the QUEEN'S HOSPITAL 1840–1941.) JUNIOR CLINICAL PATHOLOGIST. Previous laboratory experience not essential, but applicants should have held a resident hospital appointment. Salary £400 p.a. Appointment for 12 months, renewable. Further particulars from the Director of Clinical Pathological Services, Queen Elizabeth Hospital.

Applications, stating age, nationality, and full details of qualifications, with recent testimonials, to undersigned by 20th December. If successful candidate liable for H.M. Forces approval of Central Medical War Committee required.

G. HURFORD, Secretary.

The Queen Elizabeth Hospital, Birmingham, 15,
11th November, 1947.

THE ROYAL CRIPPLES HOSPITAL, Birmingham. (One of the largest Orthopædic Hospitals in the country with 338 Beds, for acute patients and large Outpatient Dept. in Birmingham, where over 110,000 attendances are made annually. The Hospital is also responsible for staffing Outpatient Clinics in a number of surrounding towns.)

(1) RESIDENT HOUSE SURGEON (A), vacant 1st January, 1948. Commencing salary £200 p.a., full residential emoluments. To R practitioners appointment limited to 6 months.

(2) RESIDENT HOUSE SURGEON (B2), vacant 1st February, 1948. Commencing salary £375 p.a., full residential emoluments. Appointment for 6 months.

Applications to General Secretary, 80, Broad-street, Birmingham, 15, by 17th December, 1947.

COVENTRY AND WARWICKSHIRE HOSPITAL. Ear, Nose, AND THROAT SURGEON. Appointment for 5 years in the first instance, under the terms of an agreement of service (copies of which may be had on application), and appointment will carry an honorarium of £500 p.a. Successful candidate required to practice exclusively in otorhinolaryngology.

Applications, stating full details as to medical qualifications, age, and experience, with copies of testimonials, to undersigned, from whom further details obtainable.

S. CECIL HILL, House Governor and Secretary.

COVENTRY AND WARWICKSHIRE HOSPITAL, Coventry. HOUSE SURGEON to the Ophthalmic Dept. 6 months' appointment, vacant 1st January, 1948. Salary £200 p.a., full residential emoluments.

Applications, stating age, qualifications with dates, nationality and accompanied by 3 recent testimonials (copies), should be, sent to: S. CECIL HILL, House Governor and Secretary.

COVENTRY AND WARWICKSHIRE HOSPITAL. House SURGEON (A) for Fracture and Accident Wards now about to be reopened. Salary £200 p.a., full residential emoluments. Appointment for 6 months in first instance.

Applications, with full details, to House Governor.

COVENTRY AND WARWICKSHIRE HOSPITAL. Resident MEDICAL OFFICER. Appointment for 12 months in first instance. Salary £500 p.a., full residential emoluments. Applicants must hold the degree of Doctor of Medicine or the membership diploma of the Royal College of Physicians, London.

Applications, stating full details as to age, medical qualifications, and experience, with copies of recent testimonials, to: S. CECIL HILL, House Governor and Secretary.

CITY OF COVENTRY. Coventry Education Committee invite applications for post of ASSISTANT SCHOOL MEDICAL OFFICER AND ASSISTANT MEDICAL OFFICER OF HEALTH (Male). Applicants should preferably be under 40 years of age. Possession of D.P.H. an advantage. Duties mainly in connexion with medical inspection and clinic treatment of school-children. Commencing salary £650, annual increments £25 to maximum £850 p.a., plus bonus. Successful candidate required to pass medical examination, to contribute under Local Government and Other Officers Superannuation Act, 1937, as amended by Coventry Corporation Act, 1936, in regard to annuities to widows, and to Coventry Municipal Officers' Widows' and Orphans' Pension Fund.

Applications (no forms provided), stating age, qualifications, and experience, enclosing copies of 2 recent testimonials, by 16th December, 1947, to: CHARLES BARRATT, Town Clerk.

The Council House, Coventry, 13th November, 1947.

COUNTY OF WARWICK. Nuneaton Emergency Hospital. (320 Beds.)

RESIDENT MEDICAL OFFICER (B1), now vacant. Salary £350 p.a., plus cost-of-living bonus and usual residential emoluments. Appointment for 12 months.

RESIDENT HOUSE PHYSICIAN (B2), now vacant. Salary £300 p.a., plus cost-of-living bonus and usual residential emoluments. Appointment for 6 months.

Application forms obtainable from H. J. KOTCH, Shire Hall, Warwick, and returnable to him as soon as possible.

THE GUEST HOSPITAL, Dudley. (150 Beds.) Casualty House SURGEON (A), now vacant. Salary is at the rate of £200 p.a., full residential emoluments. To R practitioners appointment will be for a period of 6 months.

Applications to—

H. RAYMOND HURST, House Governor and Secretary.

20th November, 1947.

GLOUCESTERSHIRE COUNTY COUNCIL. Sunnyside Mater- NITY HOSPITAL, CHELTENHAM. JUNIOR OBSTETRIC OFFICER (B2). This Hospital of 63 Beds deals with the majority of abnormal midwifery cases in North Gloucestershire and is recognised for the purposes of training for the D.R.C.O.G. Salary £250 p.a., full residential emoluments. Appointment for 6 months in first instance and will not exceed 1 year. Appointment subject to conditions of Local Government Superannuation Act, 1937, and to satisfactory medical examination by the Council's Medical Adviser.

Applications, stating age, qualifications, and experience, with copies of 3 recent testimonials, to the County Medical Officer of Health, 18, Berkeley-street, Gloucester.

GUY H. DAVIS, Clerk of the County Council.

Shire Hall, Gloucester, 20th November, 1947.

ROYAL SALOP INFIRMARY, Shrewsbury. (235 Beds.) Casualty OFFICER (A), Male or Female, vacant immediately. Salary £200 p.a., full residential emoluments. To R practitioners appointment for 6 months; otherwise may be extended.

Applications to: J. P. MALLETT, Secretary-Superintendent.

Board Room, 11th November, 1947.

PORT TALBOT AND DISTRICT GENERAL HOSPITAL. (85 Beds.) HOUSE SURGEON (A), Male or Female, duties commence 1st January, 1948. Salary £200 p.a., full residential emoluments. To R practitioners appointment for 6 months.

Applications to Hon. Secretary, Medical Committee, Port Talbot and District General Hospital, Port Talbot, Glam.

THE ROYAL GWENT HOSPITAL, Newport, Mon. (255 Beds.) HOUSE PHYSICIAN (A), vacant 14th December, 1947. Duties include attendance in V.D. Dept. of the Hospital, which is recognised by Ministry of Health for a special certificate. Salary £175 p.a., full residential emoluments. To R practitioners appointment for 6 months.

Applications, stating age, nationality, qualifications with dates, details of previous appointments, with 3 recent testimonials, to: T. A. JONES, Secretary-Superintendent.

5th November, 1947.

COUNTY BOROUGH OF NEWPORT. Social Welfare Com- MITTEE. JUNIOR RESIDENT MEDICAL OFFICER (A), temporary appointment, at Wooloston House Hospital, Newport, Mon. Salary £200 p.a., full residential emoluments. All fees with the exception of coroner's fees, are payable to Social Welfare Committee. To R practitioners appointment for period of 6 months: otherwise 12.

Applications, accompanied by 2 recent testimonials (copies), at once to: TOM KAY, Director of Social Welfare, Social Welfare Department, Town Hall, Newport, Mon.

SWANSEA GENERAL AND EYE HOSPITAL. House Physician (A), Male or Female, vacant 20th December, 1947. Salary £200 p.a., full residential emoluments. To R practitioners appointment for 6 months.

Applications to: O. C. HOWELLS, Secretary-Superintendent.

EYE, EAR, AND THROAT HOSPITAL FOR SHROPSHIRE AND WALES, SHREWSBURY. HOUSE SURGEON (B1), Male or Female, in E.N.T. Dept. Hospital recognised for D.L.O. (R.C.S.) Eng. Salary £275 p.a., full residential emoluments. Preference given to applicants with experience of otolaryngology. Applicants with specialised diploma or higher qualification will receive additional remuneration commensurate with experience.

Applications, stating age, qualifications with dates, and nationality, with copies of recent testimonials, to—

C. S. ASBURY, Secretary.

13a, College Hill, Shrewsbury, 15th November, 1947.

EYE, EAR, AND THROAT HOSPITAL FOR SHROPSHIRE AND WALES, SHREWSBURY. OPHTHALMIC HOUSE SURGEON (B1) (Male or Female), vacant 1st January, 1948. Salary £275 p.a., full residential emoluments. Hospital fully recognised by the Examining Board, R.C.S., for D.O.M.S.

Applications, stating age, qualifications with dates, nationality with copies of recent testimonials, to: C. S. ASBURY, Secretary.

13A, College Hill, Shrewsbury, 17th November, 1947.

THE ROBERT JONES AND AGNES HUNT ORTHOPÆDIC HOSPITAL, OSWESTRY. (450 Beds plus 100 E.M.S. Beds.) RESIDENT HOUSE SURGEON (B2), immediate vacancy. Salary £200 p.a., full residential emoluments. To R practitioners appointment limited to 6 months.

Applications, stating age, nationality, qualifications, &c., with copies of testimonials, to be forwarded at once to—

JOHN C. MENZIES, Secretary-Superintendent.

THE WELSH REGIONAL HOSPITAL BOARD.

(*a*) REGIONAL PSYCHIATRIST. Salary £1900 p.a. Duties mainly concerned with advice on mental health questions to the Board, and applicants should have had wide experience in general psychiatry, including administrative experience of both inpatient and outpatient work.

(*b*) ASSISTANT SENIOR MEDICAL OFFICER. Commencing salary £1450 p.a., annual increments £50 to maximum £1650 p.a. Duties mainly concerned with the planning and organisation of the hospital and specialist service in Wales under the general direction of the Senior Administrative Medical Officer to the Board, and to carry out any other administrative and executive functions which may be assigned to him from time to time.

Above salaries subject to deduction of 6 % for superannuation. Successful applicants required to devote the whole of their time to the duties of their office, and the appointments terminable by 3 months' notice on either side.

Applications, stating age, qualifications, and experience, with names of 3 referees, by 29th December, 1947, to the Secretary, Welsh Regional Hospital Board, Temple of Peace and Health, Cathays Park, Cardiff.

MINISTRY OF HEALTH. Welsh Board of Health, Cardiff. Medical OFFICERS. Applications invited from registered medical practitioners (Men or Women) for following permanent pensionable appointments:—

Medical Member of the Board. Inclusive salary scale £1550–£50–£1750 p.a. Applicants must be of high professional standing with organising ability and wide experience of public health administration.

Medical Officer. Inclusive salary scale £1150–£30–£1300–£50–£1500 p.a. (London rate), less a small deduction for provinces. Minimum of scale linked to age 38, with deductions below that age of £30 p.a., and additions of £30 p.a. up to age 40. Applicants must have been qualified for at least 10 years and should have held an appointment in the public health service and have experience of work in relation to infectious diseases.

For both posts a knowledge of the Welsh language is desirable. Selection will be by competitive interview of suitable candidates, under arrangements made by the Civil Service Commissioners.

Further particulars and forms of application obtainable from Establishment Officer, Welsh Board of Health, Cathays Park, Cardiff. Completed forms must be received by 20th December, 1947.

LLANDUDNO AND DISTRICT HOSPITAL, Llandudno. (70 Beds.) HOUSE SURGEON (A), now vacant. To R practitioners appointment will be for a period of 6 months. Salary £150 p.a., full residential emoluments.

Applications should be addressed to the Secretary.

INVERNESS DISTRICT MENTAL HOSPITAL. Junior Assistant MEDICAL OFFICER (B1). Salary £490 p.a., board, lodging, and laundry. Appointment subject to Asylums Officers Superannuation Act, 1909.

Applications immediately to Medical Superintendent.

GLASGOW OPHTHALMIC INSTITUTION. Board of Managers invite applications for post of HONORARY ASSISTANT SURGEON. Appointment subject to annual reappointment. Particulars as to duties, &c., obtainable from Superintendent, Glasgow Royal Infirmary, 84, Castle-street, Glasgow, C.4.

Applications, with 3 names for reference, to be lodged with undersigned by 31st December, 1947.

A. A. MACIVER, Secretary.

Office: 135, Buchanan-street, Glasgow, C.1.

GLASGOW ROYAL INFIRMARY. Registrar in the Burns Dept. of Glasgow Royal Infirmary. Salary £350 p.a., rising by £50 to £400 p.a., full residential emoluments. Further particulars regarding duties, &c., obtainable from Superintendent, Glasgow Royal Infirmary, 84, Castle-street, Glasgow.

Applications, giving 3 names for reference, should be submitted to: A. A. MACIVER, Secretary.

Office: 135, Buchanan-street, Glasgow, C.1.

STIRLING ROYAL INFIRMARY. Anæsthetist (whole time). Applicants must hold D.A. Post will be comparable to R.S.O. and will carry a salary of £700, with residential emoluments.

Applications, with testimonials and names of 2 referees, to Medical Superintendent, Stirling Royal Infirmary, by 31st December, 1947.

UNIVERSITY OF ST. ANDREWS. The University Court invites applications for appointment as CHANDOS PROFESSOR OF PHYSIOLOGY in the United College, to take effect from 1st October, 1948. Salary £1550 p.a. The University operates a scheme of family allowances and a grant towards expenses of removal may be made.

Further particulars obtainable from undersigned, to whom 1 copy application, with testimonials and/or names of 3 referees, should be submitted by 28th February, 1948.

DAVID J. B. RITCHIE, Secretary.

The University, St. Andrews, 12th November, 1947.

NATIONAL HEALTH SERVICE (SCOTLAND) ACT, 1947. NORTH-EASTERN REGIONAL HOSPITAL BOARD, SCOTLAND. ADMINISTRATIVE MEDICAL OFFICER. Inclusive salary £1850 p.a., subject to deduction of 6 % superannuation contributions. The Medical Officer appointed required to devote his whole time to the duties of his office and will act as medical adviser of the Board on the planning, organisation, and staffing of the hospital and specialist services of the Region, and carry out such other administrative and executive functions as the Board may assign to him from time to time.

Applications, giving particulars of qualifications and experience, with names and addresses of 3 referees, to the Chairman, North-Eastern Regional Hospital Board, 1, Albyn-place, Aberdeen, by 27th December, 1947.

NORTHERN REGIONAL HOSPITAL BOARD (Scotland). (Highland Area.) ADMINISTRATIVE MEDICAL OFFICER AND SECRETARY. Salary £1750 p.a. The Medical Officer appointed expected to devote his whole time to the duties of his office and shall act as the medical officer of the Board on the planning, organisation, and staffing of the hospital and specialist services of the Region, and shall also carry out such other secretarial, administrative, and executive functions as the Board may assign to him from time to time. Appointment terminable by 3 months' notice on either side. A Treasurer will be appointed who will also act as an Assistant Non-Medical Secretary. The area comprises the Counties of Inverness (including Skye and the Outer Islands), Nairn, Ross and Cromarty, Sutherland and Caithness.

Applications, stating particulars of qualifications and experience, with names of 3 referees, to the Chairman of the Northern Regional Hospital Board, 46, High-street, Inverness, by 8th January, 1948.

EASTERN REGIONAL HOSPITAL BOARD, Scotland. Senior ADMINISTRATIVE MEDICAL OFFICER. Inclusive salary £1850 p.a. Applicants should be qualified medical practitioners and have had wide experience in medical administration. Appointee expected to act as the Board's adviser in planning, organisation, and staffing of the hospital and specialist services, and to carry out any administrative and executive functions which may be assigned to him. Appointment subject to superannuation and to 3 months' notice of termination on either side.

Applications, giving particulars of qualifications and experience, with names of 3 referees, to the Chairman, Eastern Regional Hospital Board, City Chambers, Dundee, by 20th December, 1947. Envelopes should be endorsed "S.A.M.O." Canvassing will be a disqualification.

WESTERN REGIONAL HOSPITAL BOARD, Scotland. Senior ADMINISTRATIVE MEDICAL OFFICER. Inclusive salary £2500 p.a. Applicants should have had wide experience in medical administration. Appointee expected to act as the Board's adviser in the planning, organisation, and staffing of the hospital and specialist services, and to carry out any administrative and executive functions which may be assigned to him. Appointment subject to superannuation and 3 months' notice of termination on either side.

Applications, giving particulars of qualifications, and experience, with names of 3 referees, to Chairman, Western Regional Hospital Board, 65, Renfield-street, Glasgow, C.2, by 20th December, 1947. Envelopes should be endorsed "S.A.M.O." No canvassing.

SOUTH-EASTERN REGIONAL HOSPITAL BOARD, Scotland. SENIOR ADMINISTRATIVE MEDICAL OFFICER. Candidates should have wide experience in medical and hospital administration. Salary £2250 p.a., subject to superannuation.

Applications, stating age, qualifications, and experience, with names of 3 referees, to Chairman, South-Eastern Regional Hospital Board, Scotland, 11, Drumsheugh-gardens, Edinburgh, by 15th December, 1947.

CORPORATION OF DUNDEE. Public Health Department WESTGREEN MENTAL HOSPITAL. JUNIOR ASSISTANT MEDICAL OFFICER (A), now vacant. Salary £300 p.a., plus war bonus, full residential emoluments. To R practitioners appointment for 6 months.

Applications, stating age, nationality, qualifications with dates accompanied by copies of 3 recent testimonials, to Medical Superintendent.

ARBROATH INFIRMARY, Angus. (Voluntary Hospital—113 Beds.) HOUSE SURGEON (A) and HOUSE SURGEON (B2). Appointments open to Male practitioners for 6 months, from 1st February, 1948. Salary for A post, £140 p.a., for B2 post, £160 p.a. Full residential emoluments.

Applications immediately to: W. J. BALL Administrator.

THE MEDICAL RESEARCH COUNCIL OF IRELAND, 85, Merrion-square, DUBLIN. Applications invited from suitably qualified persons for position of Whole-time BACTERIOLOGIST to work in conjunction with the chemists already employed by the Council in research into the chemotherapy of tuberculosis. Applicants must be medically qualified and have had wide research experience. Some experience of clinical medicine desirable but not essential. Salary scale £1300–£50–£1500 p.a. Suitable pension scheme will be arranged. Appointment made for 1 year in the first instance.

Fuller particulars obtainable on application to the Secretary,

PUBLISHED by the PROPRIETORS, THE LANCET LIMITED, 7, Adam Street, Adelphi, in the County of London,
Printed by HAZELL, WATSON & VINEY, LTD., London and Aylesbury—Saturday, November 29, 1947.
PRINTED IN GREAT BRITAIN—Entered as Second Class at the New York, U.S.A., Office.

THE MEDICAL RESEARCH COUNCIL OF IRELAND is prepared to consider applications for the following appointments:—

2 SENIOR WHOLE-TIME RESEARCH FELLOWSHIPS. Salary scale £1000–£50–£1200.

4 JUNIOR WHOLE-TIME RESEARCH FELLOWSHIPS. Salary scale £500–£50–£700.

In the case of the Senior Fellowships applicants must be medically qualified and have had considerable experience of research work.

Fuller information obtainable on application to the Secretary, The Medical Research Council of Ireland, 85, Merrion-square, Dublin.

UNIVERSITY OF MELBOURNE. Applications invited for position of ASSISTANT DIRECTOR of the Public Health Laboratory in the School of Bacteriology. Applicants must be graduates in medicine who have had postgraduate experience in bacteriology, including virus diseases. Duties consist of direct control and supervision of routine diagnostic bacteriology, serology, and virology, teaching in these subjects and research. Successful candidate will enjoy the rights and privileges accorded to senior members of the University staff. Salary range £800 (Aust.) to £1000 (Aust.) p.a., plus £66 p.a. cost-of-living adjustment. Commencing salary according to qualifications and experience.

Further particulars may be obtained from the Secretary, Universities Bureau of the British Empire, 8, Park-street, London, W.1. Closing date for the receipt of applications (in Melbourne) is 12th December, 1947.

UNIVERSITY OF OTAGO MEDICAL SCHOOL, Dunedin, New ZEALAND. Applications invited for position of TRAVIS RESEARCH FELLOWSHIP IN BACTERIAL METABOLISM. Successful applicant expected to conduct research on problems of intermediary metabolism in the acid-fast bacteria. Salary according to qualifications (maximum, £800–£1000 (N.Z.) p.a.). Further particulars obtainable from High Commissioner for New Zealand, 415, Strand, London, W.C.2.

Applications close with the Registrar, University of Otago, Dunedin, New Zealand, on 31st December, 1947.

H. CHAPMAN, Registrar.

BRITISH MEDICAL ASSOCIATION. Applications are invited for the appointment of MEDICAL DIRECTOR of the Empire Medical Advisory Bureau, which the Council of the Association has decided to establish with a view to providing an advisory service for practitioners visiting the United Kingdom, particularly those from the Dominions and Colonies. The main objects of the Bureau are to make available information as to facilities for postgraduate study, to maintain a register of hotel accommodation, to arrange private hospitality, and to provide a wide range of general information, including facilities for sport, travel, and entertainment. The Medical Director will be appointed to the official staff of the Association and will be responsible, under the direction of a committee of management, for the general organisation and administration of the Bureau. The Association's superannuation scheme for officials will apply to the post. Office accommodation and clerical staff will be provided at B.M.A. House. Candidates must be registered medical practitioners, with considerable experience in their profession, and with ample administrative and organising ability. The salary for the post will be between £1500 and £2000 p.a., according to the qualifications and experience of the successful applicant.

Applications, with full particulars of qualifications, experience, age, &c., together with the names and addresses of 3 persons to whom reference may be made, should be sent to the Secretary of the British Medical Association, B.M.A. House, Tavistock-square, London, W.C.1, not later than 5th December, 1947.

A Provincial Hospital doing research work of considerable importance is anxious to secure the services of a Research Fellow. An aptitude for photography is desirable.—Reply: BOX E. 480, LEE & NIGHTINGALE, Liverpool.

THE CIVIL SERVICE COMMISSIONERS require Principal SCIENTIFIC OFFICER at the Royal Air Force Institute of Aviation Medicine, Farnborough, Hants, under the Air Ministry. Permanent post, subject to period of probation, pensionable under the Federated Superannuation System for Universities. The duties will be to organise and carry out research in pure and applied physiology in relation to factors affecting the efficiency or survival of personnel engaged in flight. Candidates must have been born on or before 1st August, 1915, and must have a First- or Second-class Honours Degree in a scientific subject, or equivalent qualification and considerable experience of research: medical qualification not essential. Salary scale will be £860–£1155 (men); for women the salary scale is somewhat lower.

Further particulars and application forms obtainable from Secretary, Civil Service Commission, Scientific Branch, 27, Grosvenor-square, London, W.1, quoting No. 2071, to whom completed application forms should be returned no later than 12th January, 1948.

COVENTRY JOINT LABORATORY. Experienced Biochemist required to take charge, under Medical Director, of Biochemical Dept. at above laboratory. Salary range, according to qualifications and experience, £600–£850 p.a. Applicants must possess a science degree, had postgraduate experience, and be familiar with the scope of biochemical investigations in a large clinical laboratory. The appointment is superannuated.

Applications, with copies of testimonials, to be addressed to the Medical Director, The Coventry Joint Laboratory, The Coventry and Warwickshire Hospital, Stoney Stanton-road, Coventry.

CITY OF BIRMINGHAM. Dudley Road Hospital. (Municipal General Hospital with 1050 Beds.) ASSISTANT BIOCHEMIST. Candidates must hold a university degree in science, and preferably have experience of hospital biochemistry. Commencing salary £450 p.a., by £25 p.a. to £550 p.a.

Applications in first instance to Medical Superintendent, Dudley Road Hospital, Birmingham, 18.

Required, Laboratory Technician, grade B. Salary scale £350–£395 for holders of an examination of the standard of the Final Examination of the Institute of Medical Laboratory Technology. Technicians possessing the qualification of the Fellowship of the Institute of Medical Laboratory Technology are eligible for further increments up to £425 p.a.

Applications, stating age and giving details of experience, to be sent to the Superintendent-Secretary, CAERNARVONSHIRE AND ANGLESEY INFIRMARY, Bangor, North Wales.

May & Baker Limited have vacancies for a Bacteriologist and a BIOCHEMIST with experience in chemotherapy research. Bacteriologist would also be required to take charge of penicillin-testing laboratory. Salary according to qualifications and experience.—Apply initially in writing, quoting reference number 884, to: Personnel Officer, May & Baker Ltd., Dagenham, Essex.

Required, Works Medical Officer at large Oil Refinery in the North-West. Preference given to those who have experience in industrial medicine and hold a Diploma in Industrial Health. Commencing salary not less than £1000 p.a. Pension rights.—Please supply details, regarding age, qualifications, and experience, also when available, to: Address, No. 886, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

A Radiotherapist is wanted in private practice in S. Africa. Com-mencing salary £2500–£3000, depending on qualifications. Applicants should make certain that they have the necessary qualifications to be put on the Register of Specialist Radiologists in S. Africa.—Applicants should send 2 copies of their applications to: Dr. I. G. WILLIAMS, Radiotherapy Department, St. Bartholomew's Hospital, London, E.C.1.

Small Panel Practice for Sale, owing to illness, Midland Industrial Town. Approximate average fees (3 years) £1000, certified accounts available. Can be purchased with or without residence. —J. PATERSON BRODIE & SON, Incorporated Accountants, Moor House, Bursiem, Stoke-on-Trent.

Will Rural or Country Town Practitioner considering retirement or partnership now or April next please communicate with: Address, No. 892, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

General Practice with V.D. appointment wanted. Capital available.—Address, No. 893, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Vacancies are occurring from time to time for Assistants, Locums, Hospital Locums, and Ships' Surgeons appointments. Practices and partnerships for Disposal.—Write: A. SHAW, Medical Agent, Premier Buildings, 88, Church-street, Liverpool, 1.

Registrar requires part-time work—evening surgeries—week-ends. S.W. London or suburbs.—Address, No. 885, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Physician travelling to South Africa this winter. Available suitable professional capacity.—Address, No. 895, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Secretary-Receptionist required. Knowledge of elementary nursing and bookkeeping essential.—Dr. BARSBY, 19, Queen Anne-street (LANgham 3435).

For Sale, Manchester, Modern Nursing-home, well situated, 3½ acres. Freehold. Equipped latest instruments, modern theatre. Immediate possession.—Particulars from: MENDES DA COSTA GREENWOOD & CO., 70, Finsbury-pavement, London, E.C.2.

Shorthand Typist, with good knowledge medical terms, would undertake correspondence, &c., mornings or evenings. 3s. 6d. per hour.—Address, No. 894, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Adoption of Children.—To overcome the risk inherent in privately arranged adoptions, the Church of England Children's Society, which is a registered Adoption Society, is ready at all times to help those wishing to offer a child for adoption, and who deserve such assistance.—CHURCH OF ENGLAND CHILDREN'S SOCIETY, Old Town Hall, Kennington, S.E.11.

Clinical Pathology.—The Clinical Department of the Hosa Research Laboratories, Sunbury-on-Thames (Tel.: Sunbury 2300), is staffed and equipped to undertake clinical pathological work of all types, including hæmatology, bacteriology, biochemistry, histology, pregnancy tests, &c., for medical and dental practitioners and hospitals. Outfits of specimen containers are provided on request, and reports are normally sent within 24 hours of receipt of specimens. Full details, with scale of fees, on application to the Clinical Director.

"Short Wave Therapy," Schliephake. Copies of this authoritative textbook, price 21s. net, again available from medical booksellers, or from the ACTINIC PRESS, Guardian House, Walthamstow, London, E.17.

Wanted, for research purposes, one or more Weighing Machines suitable for patients, and accurate to 1 oz. Must be reliable and in serviceable condition.—Address, No. 890, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Examination Couch, perfect condition, 2 drawers, adjustable. 6′ 6″ × 3′. 18 guineas.—W. J. SAUNDERS, 122, Chevening-road, N.W.6 (LADbroke 2809).

Typewriting, Duplicating, Medical Manuscripts, &c. Immediate ser-vice. Satisfaction guaranteed. (Ex-R.A.M.C.)—SPECIALIST TYPEWRITING BUREAU, 30, City-road, E.C.1 (MON. 4881, MAI. 6344).

Typewriting Service: Testimonials, Theses, Notes, &c., accurately and speedily typed.—Phone: HAMpstead 7949 after 1 P.M. daily.

Wanted, 3 Contax Model III Cameras.—Dollonds (L), 28, Old Bond-street, London, W.1.

Microscopes readily turned into cash. Highest prices paid for modern instruments and accessories.—Send apparatus for valuation to: WALLACE HEATON LTD., 127, New Bond-street, London, W.1. MAYfair 7511.

Electric Razors available for medical use, Remington, Schick, Shavemaster, &c., and spares; also non-electric shavers.—Write: HILLS, 6, Blunt-road, South Croydon.

1 *Constant composition and potency give greater precision of dosage*

2 *Uniform, speedy absorption—suitable for oral and intravenous use*

3 *More rapid elimination reduces risk of toxic effects*

DIGOXIN 'B.W. & CO'

'Tabloid' brand Digoxin, 0·25 mgm. *(for oral administration)*
Solution of Digoxin 'B.W. & Co.', 0·5 mgm. in 1 c.c. *(for oral administration)*
'Wellcome' brand Injection of Digoxin, 0·5 mgm. in 1 c.c. *(for intravenous administration)*

BURROUGHS WELLCOME & CO. (THE WELLCOME FOUNDATION LTD.) **LONDON**